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Presented by the author
Insurance, Marine

HINTS

ON

SEA-RISKS,

CONTAINING SOME PRACTICAL SUGGESTIONS
FOR DIMINISHING MARITIME LOSSES
BOTH OF LIFE AND PROPERTY;

ADDRESSED TO

MERCHANTS, SHIP-OWNERS, AND
MARINERS.

BY

LIEUT. EDWARD JENNINGS, R.N.

"England expects every man will do his duty."

LONDON:

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P R E F A C E .

In the report* of the Select Committee of the House of Commons on Shipwrecks, presented August 15th, 1836, under the heading—

1.—“ Extent of Loss in Property and Lives at Sea,” it appears—

“ 9.—That the whole loss of property in British shipping wrecked or foundered at sea, may be assumed as amounting to nearly THREE MILLIONS STERLING PER ANNUM ; the value of which property, though covered by insurance to certain parties, is not the less absolutely lost to the nation, and its cost paid for by the *British public, on whom its loss must ultimately fall.*”

“ 10.—That the annual loss of life, occasioned by the wreck or foundering of British vessels at sea, may, on the same grounds, be fairly estimated at *not less* than ONE THOUSAND PERSONS in each year, which loss is also at-

* A copy of this report will be found in the Nautical Magazine for 1836. page 568—569.

“tended with increased pecuniary burdens to the British public, on whom the support of many of the widows and orphans left destitute by such losses must ultimately fall.”

Further, from returns made before the Committee of the House of Commons, it appears that, upon the average of 1841 and 1842, six hundred and eleven ships have been lost in each year.

And lastly, the shipwrecks in only three days between the 13th and 17th of January of the present year, (1843,) were stated in the newspapers to amount to *two hundred and forty vessels*, with a *loss of five hundred lives*, and *property* valued at about £825,000.

With such statements on record, every one is called upon to assist, as far as he individually can, with any information which may be made available to diminish sea-risks.

It is truly said that “prevention is better than cure,” and in all cases of emergency “to be forewarned, is to be forearmed.” Besides, suggestions may induce reflection on different cases of accident, so as to prepare the persons exposed to them for acting on the spur of the moment when there is but little time left for thinking.

The Author’s objects in this small publication are, first, to encourage a more general use of the *Marine Barometer* in merchant vessels, and, by offering some remarks on that valuable instrument, principally grounded on many years experience at sea, to shew how *certainly*

in all climates it *forewarns* mariners of storms, and consequently enables them to be better prepared against them ;

And, secondly, to offer a few general observations to induce more caution and attention to navigating, and adding some suggestions in cases of accident and emergency.

The whole he sincerely trusts may be found to be practically useful ; and in order to its becoming so, he hopes that a copy may be in every vessel, as remedies for sea-risks must depend principally on those on board.

In conclusion, he solicits merchants and ship-owners to render their valuable assistance towards the attainment of objects of such great consequence ; and he hopes that the public will not view with indifference, subjects of so much national importance.

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ERRATA.

Page 1, line 3, for *its* read *their*.

Page 13, line 14, for in *shore* read *in-shore*.

Page 25, line 11, for *Raleighs* read *Raleigh's*.

Page 53, line 1, for *tides-way*, read *tide's-way*.

Page 93, line 3, for *were* read *where*.

BAROMETRICAL INDICATIONS IN THE MEDITERRANEAN.

The Author not having served much in the Mediterranean, has omitted to give any Barometrical indications for that station. That omission however is so very ably supplied in Capt. Glascock's Manual, Vol. II., page 165, (who attributes the observations there given on the Barometer to Capt. W. Smith, R.N., F.R.S.) that the following extracts from it are prefixed.

"By this *faithful guide*, (THE BAROMETER) I even directed the making and shortening sail, with such precision, that I never once had occasion to turn the hands up in the night; and, during a practice of many years, had cause to rejoice in the implicit trust I reposed in its powers. The deviations of the mercury *without* the tropics are greater than those within them; and are there greater and more frequent in the winter than in the summer. But though slight changes are scarcely shown near the *equator*, and heavy squalls may occur without being anticipated, yet the approach of a hurricane is foretold by the usual fall of an INCH, or MORE.

“In the *English Channel*, off the *Azores*, and along the *Atlantic* shores of *France*, *Spain*, and *Portugal*, the writer has had repeated proofs of the *unerring efficacy* of the **MARINE BAROMETER**.

“Between the capes of *St. Vincent* and *Spartel*, the south-west winds are the most disagreeable; but the depression of the quicksilver is sure to denote a violent gale. A gale in this quarter is always precursed by a long hollow swell from the westward.

“Within the *Mediterranean*, the predominant breezes are from the north and west quarters, except in the spring, when south-east and south winds prevail, but their duration and strength are extremely uncertain about the period of the equinoxes. As the Barometer does not generally vary more than a few lines, it requires great attention to mark its indications; they will, nevertheless, prove satisfactory; and it may be laid down as a general rule that, whenever the quicksilver sinks so low as 29.40, a *severe gale* may be expected.

“In the *eastern* division of the *Mediterranean sea*, the north winds are mostly dry and salubrious, though cold and often violent, while the south one is mild and moist, accompanied by rain; that from the east is laden with mist and vapour, and the western, though often stormy, produces clear skies and exhilarating effects.”

“The nature of these winds differs essentially, according to locality, but they never blow very violently without a corresponding effect upon the mercury.

“The most annoying wind is the *sirocco*. At its commencement the air is dense and hazy, with long white clouds setting a little below the summit of the mountains, and at sea floating just above the horizon, in a direction parallel to it. The Thermometer does not at

first experience a very sensible change, though it rises with a continuance of this wind to 90, and sometimes to 95; the Barometer gradually sinks to 29.60.

“In the *Adriatic* the weather is notoriously mutable; calms, thunder, and water-spouts being frequent all the summer, and heavy northerly blasts, called BORAS, with fogs and hard squalls, during the winter. The BORA* is greatly dreaded in the upper part of the Gulf of Venice, particularly in the channels of the Quarnero, where it rushes down the whole line of the Julian Alps with irresistible fury. The coming of this wind may be known some hours beforehand by dense cloud-banks on the horizon, with light fleecy clouds above it, and the sky rather lurid. Its general direction is from north to north-east, and its continuance about fifteen or twenty hours, with heavy squalls, and terrible thunder, lightning, and rain at intervals. These winds, however, give sufficient notice of their approach to an attentive observer, although violent squalls of short duration may be encountered without much Barometrical indication.”

Respecting the words engraven on the Barometer, see Col. Reid’s “Law of Storms,” page 419, where he says:—“It will be understood that to mark the words

* “Ships caught by the *bora* generally let fly every thing to receive the first blast, and immediately bear up to the southward to seek safety in any port they can fetch, or remain under bare poles until it is exhausted. Many prizes during the war were lost by these violent gusts, and some of our cruisers have been nearly laid on their beam-ends when caught unawares. In December, 1811, the French frigate, *Flora*, of forty-four guns and three hundred and forty men, was surprised by a bora, on her passage from Trieste to Venice, which threw her on the coast near Chiozza, where the captain and two-thirds of the crew perished; and in 1820, the *Monta Cuculi*, an Austrian corvette, was met by one while under all sail, and instantly foundered with all hands.”

“set fair,” usually marked on Barometers, is to bring this valuable instrument into disrepute, and instrument makers *should leave off the practice.*” And in Capt. Glascock’s Manual, Vol. II., page 166, in the paper there attributed to Capt. W. H. Smith, R.N., it is said that, —“A few general rules for interpreting the movements of the Barometer may prove acceptable to beginners, *especially as the words engraven on the side plates rather MISLEAD than instruct.*”

A Marine Barometer should be kept on board in a very secure place, open only to the officers, in order to prevent as much as possible its being struck or broken.

ON THE

MARINE BAROMETER.

PART I.

As some attention to the indications of the Marine Barometer would materially assist in diminishing sea-risks, and many of its consequent calamities; on that useful instrument I shall give a few remarks, by which I have myself benefitted, and for service at sea they may assist others.*

* In 1838, "Lieut. Col. Reid in his valuable work on the 'Law of Storms,' writes—[see page 396]—'Every policy of insurance should bind the owners, or masters of a ship insured, to provide a Barometer; and the protest should be required to show that the Barometer was registered at least once during every watch. But it ought to be registered oftener; and within the tropics, during the hurricane season, every time the log is heaved.'"

Scale of Barometer at present.		As the force of the wind is what is required for service at sea, the following would be better understood.	
INCHES.		INCHES.	
31.0	.....Very dry.	30.5	.....Very settled.
30.5	.....Set fair.	30.0	.....Fine weather.
30.0	.....Fair.	29.7	.....Unsettled.
29.5	.....Changeable.	29.5	.....Gale.
29.0	.....Rain.	29.2	.....Storm.
28.5	.....Much rain.	29.0	.....Violent storm
28.0	.....Stormy.	28.5	.....Tempest.

REMARKS ON THE BAROMETER.

When the mercury *falls* in the Barometer, it announces rain, or wind, or in general what is called bad weather; and, on the contrary, when it *rises*, it announces fair weather.

When the mercury falls in frosty weather, either snow, or a thaw may be expected; but if it rises in the winter with a north or east wind, it generally forebodes a frost.

If the mercury sinks slowly, we may expect rain, which will probably be of some continuance; but if it rises gradually, we may expect fine weather that will be lasting.

When the Barometer is fluctuating, rising and falling suddenly, the weather may be expected to be like it—changeable.

When the mercury falls very low, there will be much rain; but if its fall is low and sudden, a high wind frequently follows.

When an extraordinary fall of the mercury happens, without any remarkable change near at hand, there is some probability of a storm at a distance.

In very hot weather the fall of the mercury indicates thunder.

The Barometer will descend sometimes as an indication of wind only, and sometimes rise when the wind is to the north or east.

A north-east wind generally causes the Barometer to rise, and it is generally low with a south-west wind.

An extraordinary fall of the mercury will sometimes take place in summer previous to heavy showers, attended with thunder; but in spring, autumn, and winter, it indicates violent winds.

The mercury is higher in cold than in warm weather, and lower at noon and midnight than at any other period of the day.

The mercury generally falls at the approach of the new and full moon, and rises at the quadratures.

Before high tides, there is almost always a great fall of the mercury, this takes place oftener at the full than at the new moon.

The greatest changes of the Barometer commonly take place during clear weather with a north wind, and the smallest risings during cloudy, rainy, or windy weather, with a south or nearly south wind.

The words generally engraved on the Plate of the Barometer, rather serve to *mislead*, than to inform; for the changes of weather depend rather on the rising and falling of the mercury, than on its standing at any particular height.

When the mercury is as high as "fair," and the surface of it is *concave*, (which is the case when it begins to descend,) it very often rains; and on the contrary, when the mercury is opposite "rain," and the surface of it is *convex*, (which is the case when it begins to ascend,) fair weather may be expected. These circumstances not being duly attended to, is the principal cause that many people have not a proper confidence in this instrument.

For sea-service, it would be as well to read the Barometer off three times a day at least—at 8 A.M., noon, and 8 P.M.—and oftener if bad weather.

In our climate, if the alteration in the quicksilver should be in as great a proportion as six-tenths of an inch to twenty-four hours, sudden but not lasting changes of weather may be expected.

If the alteration should be gradual, probably in the proportion of two or three-tenths to twenty-four hours the weather indicated will be likely to last.

One-fifth of the variation of the Barometer, in any climate, in twenty-four hours, may be considered as an indication of sudden change; for example in England, the entire variation is about two inches and a half; therefore, if it should vary five-tenths in twenty-four hours; or in St. Petersburg, where the variation is three and one-third inches, six and a half tenths in twenty-four hours, would probably be no greater indication of sudden change, than the five-tenths in this climate.

If wind should follow rain, the wind may be expected to increase.

Rain following wind, is likely to lull it, and the wind may be expected to abate.

Within the tropics and near them, there is usually little or no variation of the Barometer. At St. Helena, it is little or nothing; at Jamaica, three-tenths of an inch; and at Naples, the variation hardly ever exceeds an inch. Whereas in England, it amounts to two inches and a half; and at St. Petersburg, to nearly three and one-third inches.

THE SYMPIESOMETER.

Within the tropics, the Sympiesometer is a most useful instrument, where the variation of the Barometer is but trifling. I have found the two instruments act together with uniform exactness in all climates; being a perfect tell-tale of coming changes of weather.*

I would recommend a Barometer register to be kept in the following form:—

Date.	Time.	Thermometer.	Barometer.	Variation upon each comparison.	Wind.	Latitude, nearly.	Longitude, nearly.	Remarks. H. M. Packet, <i>Tyrian</i> .
1835.	Noon	54	29. 24		S.W.	49N.	5 W.	
Feby.	2.30P.M.		29. 05	—, 19				
20th.	5 P.M.	50	28. 84	—, 21	N.			
	12 P.M.		29. 26	+, 42				At 5 P.M. a gale from NNE. came on very suddenly after heavy rain.

* Many Sympiesometers are made too short.—[See Reid, page 396.]

It will be seen from this extract, that the quick-silver fell four-tenths in five hours, and gave full two or three hours warning to shorten sail, and make snug before the gale came on; and also to wear the ship from the port-tack, and get her on the starboard-tack when the heavy rain began, which prevented her being taken aback at the time the wind shifted.

A SQUADRON DISMASTED.

To shew the advantage of attending to the indications of the Barometer, and also the inconvenience that may arise from neglecting its warnings; I will repeat a story I have often heard from some naval friends, which very fully illustrates it.—During the late war, Admiral Sir R—— S——, in the C——, eighty gun ship, and his squadron joined Sir T—— H——, in the T——, seventy-four gun ship, who was cruising off the coast of North America, with the B——, seventy-four gun ship, Capt. D——. The two latter officers were well experienced in the sudden changes and violent gales which occur on that coast. Soon after arriving on the station, Sir R—— S—— observed to Sir T—— H—— that he had heard the changes of weather were very sudden and the gales strong, and he wished to be informed when indications of such a change were observed. In a few days Sir T—— H—— telegraphed to the flag-ship—"I expect bad weather, prepare for it." It appeared, that no advantage was taken of this notice generally, by any orders to the squadron. However, after dark the T—— and

B—— were made snug by their Captains' directions. During the night a violent gale came on, and when day light appeared, every ship in the squadron had been dismasted, except the T—— and B——.

Thus a squadron of men of war were dismantled; and had it been a convoy of merchant-ships, many most probably would have foundered.

GALES IN THE BRITISH CHANNEL.

Memorandum of a very heavy gale in the chops of the Channel, H. M. Packet, *Plover*, Jan. 12th, 1828.

Time.	Barometer.
1828.	
Jan. 12th,	
Noon	29. 52
4 P.M.	29. 25
8 P.M.	29. 0
Midnight.	29. 30

From noon to 6 P.M., it had been blowing strong from the eastward, and the Barometer fell five-tenths. It then fell calm with very heavy rain; light and variable winds sprang up about 8 P.M., and the Barometer rose rapidly three-tenths in four hours. Between 9 and 10 P.M. the wind settled to the W.N.W., and freshened to a strong breeze. Between 11 and 12 it had increased to a hurricane; before which the ship scudded under a close reefed fore-top sail and fore-stay sail (with *double sheets*). On this occasion, there was plenty of warning to batten hatches, and reduce canvass.

At Falmouth, on the 15th February, 1838, the Barometer had fallen to 28.45, when a terrific gale came on early in the morning from S.S.E. with severe snow storms, during which the *Ranger* packet was driven on the rocks, and the loss of shipping on the coast was very great.

STORM OF 17TH NOVEMBER, 1840.

Date.	Time.	Thermometer.	Barometer.	* Sympiesometer.	Winds.	Remarks. H.M. Packet, <i>Alert.</i>
1840. Nov. 16th	Noon	63	29. 10	27. 90	N. E. S. E.	Squally. Moderate. Heavy rain.
17th	8 A.M. 2 P.M. 6 "	68	29. 0 29. 40 29. 70	27. 80 28. 10 28. 40	South W.S.W. West	Hurricane. A gale, but moderating. Ship 200 miles W.S.W. of Scilly.
18th	2 A.M.	63	29. 70	28. 34	S. E. S. W.	Moderate and fine.
19th	6 A.M. 5 P.M. 8 "	56 57 58	29. 55 29. 75 29. 85	28. 20 28. 42 28. 50	S. S. E. East	Strong gales.

* The Sympiesometer was at times below counting,—I conjectured its height.

STORM IN THE BRITISH CHANNEL, 1840.

It will be seen from this extract that very severe storms from south and W.S.W. took place on the 17th

of November, and strong gales from S.S.E. and east on the 19th, the wind in that time shifting all round the compass. From N.E. it shifted to S.E. against the sun, then to south, from which point it blew with the greatest violence; afterwards it drew to W.S.W.; the next day it backed to S.E., veering again to S.W. and back to S.S.E. and east. The hurricane of the 17th November, 1840, (we being then two hundred miles W.S.W. of Scilly,) was one of the most severe I ever experienced at sea, and the reported loss of shipping very great; we passed some vessels in distress in the height of the gale, to whom we could render no assistance. In the same gale H.M. ship *Fairy* foundered in the North Sea. The indications of the Barometer and Sympiesometer will be seen to have been quite correct as to previous warning.

INDICATIONS OF THE BAROMETER IN STORMS IN
THE BRITISH CHANNEL.

I have stated the indications of the Barometer in gales in November, 1840; January, 1828; and February, 1835; in the vicinity of the British Channel. A reference to Lloyd's List would shew the extent of the losses on these occasions. When the Barometer stood at 29.20 severe gales were experienced; when at 29.0 violent tempests; and when as low as 28.50 the force of the wind almost amounted to a hurricane; in each case giving some hours warning, which warning ought to be used in making the best preparation possible to prevent damage.

Merchant vessels would be less liable to casualties by lying-to, in these heavy gales, with a high, breaking and dangerous sea, than in scudding before it.

NOT TO RUN TOO LONG.

Vessels ought not to run too long when the sea is high and breaking, but bring-to in time, and do so by daylight, if possible.

ON ROUNDING-TO IN A GALE.

An old and experienced seaman remarks—"That when he wished to bring-to in a hard gale, when running before a heavy sea, he always watched for a heavy sea breaking abaft the main chains, and immediately after he eased the helm down and rounded-to at once, being previously prepared for so doing." In managing this way he found he could avoid shipping a sea.

WHEN NEAR THE COAST.

PILOTS.

Branch pilots ought always to be taken when they offer.

The eyes of a ship are "LEAD," "LATITUDE," and "LOOK OUT,"—we may now also add, the "*Longitude*" by chronometers. These four points cannot have too much attention.

TO SIGHT THE LAND OR LIGHTS.

No vessel ought to proceed up channel without sighting the land, or the Lizard, or Eddystone lights.

KEEP THE ENGLISH COAST ON BOARD.

Avoid the Coast of France, and keep more on the English shore. Have the latest edition of the "British Channel Pilot," and the latest edition also, of the "Light Houses of the British Islands" to refer to, (Sold by Bate, Poultry.)

ON MAKING YOUR PORT.

Never run for your port in very heavy gales, or thick weather, unless sure of the ship's position.

There are some ports that may be entered with safety at *night* by sailing vessels; but there are many more, where it cannot be attempted without great risk

of getting aground, or being wrecked. I do not know any thing to compensate for running that risk, except an urgent necessity—as when anchored, nothing can be done until morning.

LAY-TO.

Lay-to in preference, (and carry a light to the main stay at night,) gales do not last long, and finer weather follows.

Lying-to in gales, always keep the ship steering, with the helm nearly a midships; *never* let it be kept a-lee, as the ship will not be under command without steerage way, or so safe and easy.

LYING OFF AND ON TO ENTER A PORT.

I have known so many vessels wrecked from lying-to with a top-sail to the mast, with their head in shore, that I recommend, (if it is moderate weather,) to make short tacks under easy sail, as then the ship's place can always be kept worked up; whereas her drift lying-to is uncertain. Let the tacks in *shore* be *shorter* than the ones off, to give the coast a good berth—it is better to be a mile further out, than to get aground.

If the Barometer is 29. 10, or below it, put into a harbour of refuge if you can. I will name Beer-haven, Bantry Bay; and Crook-haven, near Cape Clear—both good in an easterly wind, and easy to get away from.

Falmouth, at the entrance of the Channel, is the best and most secure Port in it.

ON ANCHORING IN AN OPEN ROADSTEAD.

If you expect heavy weather, before the gale comes on, veer to 160 fathoms of chain on one anchor, (be sure it is a clear one.) Get the top-gallant masts on deck—yards braced for casting—sails furled, close reefed—and storm-sails ready for setting—use hawse bags, or have half bucklers on, and the hatches to be battened down.* Have a shackle ready for slipping abaft the first stopper—carry a light aloft at night, and one in the binnacle—take bearings, that will run the vessel into safety, if she parts.

TO ANCHOR AND VEER A LONG SCOPE OF CABLE.

Whenever and wherever you anchor, veer a long scope of cable AT ONCE; never lay short, unless when getting under weigh. No ship ought to lay at single anchor for more than a few hours.

Moor with a whole cable each way, as soon as possible.

* See Col. Reid, page 51, *Seagull Packet*.

All vessels ought to have swivels, and moor with one, to keep a clear hawse.

Bend the sheet cable, and see the anchor clear for letting-go as soon as you have moored. In the winter be prepared for striking lower yards and top-masts.

GALE NORTH ATLANTIC.

Memorandum of a heavy gale, in the North Atlantic, off the Banks of Newfoundland, which lasted eighteen hours, wind from S.S.E. to N.W.

H. M. Packet, *Plover*—In Lat. 44 N., and Long. 44 W.—5th Sept., 1826.

Time.	Thermo- meter.	Barometer.
10 A.M.	75	30. 07
2 P.M.	„	29. 96
6 „	„	29. 75
8 „	„	29. 70
Barometer did not fall afterwards.		

The weather threatened at noon, and the gale commenced about 4 P.M. It did not break at all until 4 A.M. the following morning. The Barometer fell two tenths in four hours, between 2 and 6 P.M.

CURRENTS.

From the 1st Sept. to the 7th, the ship was set 240 miles to the eastward, by the currents of the gulf stream, some days as much as fifty miles a day.

In naming the fact, I do it with the view, to show how necessary it is, that every vessel's navigation should be assisted by having a good chronometer on board.

CURRENTS.

In many parts of the world, the currents are even stronger; in the gulf of Mexico, often as much as sixty or seventy miles a day; and without a chronometer it is almost impossible in such cases to ascertain the ship's position.

INDICATIONS OF A "NORTHER."

West Indies, off Belize, H.M. packet, *Tyrian*, 1836.
—The Barometer had been as low as 29.80 for three days previous, continuing so from the 7th March to the 10th in the morning, when it rose to nearly 29.90. The winds on the 8th were N.E., on the 9th from E.S.E., with very sultry weather, and lightning seen in the evenings to the westward. On the 10th March at 8 A.M., the wind from being E.S.E. died away to calm, and the weather looked dark and showery. At 11 A.M. a light air from N.N.W. sprang up; at noon no observation. It then came on to rain and blow from N.N.W., which reduced us to close reefed top-sails, and courses furled.

West Indies, H. M. packet, *Plover*, July 1827—
within two or three days sail of Barbadoes.

Date.	Time.	Thermometer.	Barometer.
July 12th	10 A.M.	83	30.20
13th	10 A.M.	83	30.16
	4 P.M.	84	30.11
	7 P.M.	83	30.16

The thunder squalls began by heavy showers—the wind then (before 8 A.M.) N.E. by E., and a regular trade wind.

Heavy showers again came on at 10.30 A.M., which continued until noon. The wind had not then increased much.

At noon the wind shifted into S.E., and thunder storms, with very strong squalls came on.

When the showers came on, took in all studding-sails.

When the wind began to shift, clewed-up and furled every thing, (kept the fore-top-mast-stay-sail set.)

These thunder squalls came on several days exactly at noon. This year, in August, severe and destructive hurricanes were experienced in the West Indies.

The *Hearty*, packet, was missing the previous month, but from what cause was never known.

WEST INDIES.—INDICATIONS OF HURRICANE
WEATHER.

August, September, and October, are considered the hurricane-months.

In that season, let the weather be particularly attended to towards the full and change of the moon, and watch the Barometer with attention.

The indications of a hurricane are—

The stars not being visible at night, and the weather very unsettled ;

A heavy swell ;

The wind veering from the regular trade ;

And a considerable fall of the Barometer.

Whenever you have heavy rain in that season in the West Indies, be as cautious as possible with the canvass, and have no sail you can help set.

When the wind begins to shift, take in and furl every thing.

It has been said that when two new moons occur in either of the hurricane months, a hurricane has usually occurred that year.

SOME OBSERVATIONS ON A HURRICANE IN WHICH A
PACKET WAS DISMASTED IN THE GULF OF
MEXICO, IN OCTOBER.

She experienced heavy gales from the northward for four or five days preceding—Barometer mostly at

29. 60. On the day of the hurricane, it fell to 28. 60 by 6 A.M.—and the hurricane began at about 8 or 9 A.M. The wind from having been N.N.W., shifted to N.N.E. At noon it moderated, and became fine for half an hour, but the Barometer did *not* rise. The wind then gradually freshened from the S.E., and it blew harder than ever. The ship had no canvass set, but was hove on her beam-ends by the force of the wind—she righted on cutting away a lower mast.

HURRICANE, 1837.

To shew the irresistible force and power of a hurricane, I may mention that in January, 1839, I was in the land-locked harbour of St. John's, in the island of Porto Rico, where I saw six large vessels on shore to the southward of the town, which had been wrecked there in the hurricane of 1837. They were quite up in the country, being between two and three hundred yards from any water. I never saw vessels in such a situation. The water was said to have risen thirty feet.

SEAGULL PACKET IN THE SAME HURRICANE.

To show what may be done by sound judgment, prompt decision, and good seamanship, the following facts may be stated—at the very time these vessels were wrecked in the land-locked harbour of St. John's, Porto Rico, H. M. Packet, *Seagull*, (Lieut. John Parsons, R.N.

20 SEAGULL PACKET IN THE SAME HURRICANE.

Commander,) was caught AT SEA in the Gulf of Florida, (a dangerous navigation at all times,) in the same hurricane. She was on a lee shore, in four and a half fathoms of water, with all her sails split, and blown out of the bolt-ropes. Lieut. Parsons was therefore under the necessity of anchoring, which he did, and veered to one hundred fathoms of chain; he did not let go the other anchor, fearing she might FOUNDER, as the sea was making a fair breach over her, and rolling aft to the wheel on the quarter-deck.* Lieut. Parson's skill and conduct upon this occasion most probably saved the vessel and crew. He was not however content with this, but would not even leave his anchor and a few fathoms of chain behind him, but hove it up in a heavy swell and sea, as if he had been going out of harbour. Many persons would have slipped, in order to get sea-room from the reef as soon as possible.

PREPARATIONS FOR A HURRICANE AT SEA.

Endeavour to get sea room; if you have it, run before the wind.†

The captain and 1st mate to conn the ship.

Two or three of the best men to steer.

Second mate to keep the time, and the courses steered, and have the ship's place kept worked up.

* See Reid's Law of Storms, [page 51.]

† I say, "run before it," (only as a choice of evils,) as I fear most vessels would upset lying-to,—witness Raleigh, and many other instances I could name.

Previous to its coming on, have a life-line set up on each side of the deck.

Furl *all* sails, and secure them with studding sail tacks, as well as long gaskets.

Batten hatches, and have relieving tackles to tiller.

Down top-gallant-yards, and send top-gallant-masts on deck, and flying jib-boom in.

Clear the tops—gaffs down.

Rudder chocks, and spare tiller at hand.

Axes and hawsers at hand—scuppers clear.

Pumps ready—let each man wear a belt as described in page 28.

Keep after-yards square—head-yards thrown forward—have the fore-stay-sail set with double sheets.

PREPARATIONS FOR A HURRICANE AT AN ANCHOR.

The ship should be moored with a whole cable each way if in harbour; or if in an open roadstead, veer to a hundred fathoms on a single anchor.

The more your berth is out of the way of other ships the better, as vessels driving, or getting adrift occasion much damage to those who might otherwise have held on.

If moored, the sheet cable to be bent and ranged, and the anchor let go, and veer on the bowers to the clinches.

All the ground tackle you have should be used.

Have a *shackle* abaft the foremost stopper on each cable, ready for slipping, if absolutely necessary, to prevent swamping, or from other causes.

22 PREPARATIONS FOR HURRICANE AT ANCHOR.

Batten down fore and aft.

Down top-gallant-yards and masts.

If time, unbend sails, (top sails and courses I mean.)

Strike lower-yards and top-masts.

Get yards as much fore and aft as possible.

Jib-boom eased in.

Keep try-sails and fore-stay-sail bent, and the former reefed.

Unreeve running rigging (that nothing may be aloft to hold wind.)

Clear tops.

No boats to be above the gunwale.

Axes and hawsers up ready.

If anchors drag, cut away lower masts, the rigging being first cut and cleared. Remember the stays.

At the Island of St. Thomas, in the West Indies, there is a very intelligent harbour-master,—I have been there when he has made the signal,—“Prepare for a hurricane.” It would be well if the same previous information was given at our own Islands, when the Barometer foretold it,* as it would enable shipping to prepare; vessels in open roads have more chance of security at sea than at an anchor. If at Barbadoes, and you could get a degree to the southward of it, you might escape altogether. At Grenada the hurricanes have been seldom felt.

* In such a calamity to the inhabitants as a hurricane, if the church bells were then to be rung, as a warning, many might save their lives, and perhaps a portion of their property.

Pamperos blow from the S.W. Before coming on the wind shifts from N.E. to N.W. and vivid lightning. When the lightning first commences, clew up and furl all. Keep try-sails and fore-stay-sail ready for setting. If you are in the river Plate, above Maldonada, when you clew up, anchor with both bowers, veer a good scope of cable, say sixty or seventy fathoms on each. Secure hatchways, and have scuppers clear.

Date.	Time.	Ther- mometer.	Barometer.
1825			
Dec. 7th	1 A.M.	67	29. 83
H. M.	4 „		29. 76
packet,	8 „		29. 70
<i>Plover.</i>	Noon	65	29. 82

Here the Barometer foretold the Pampero with great accuracy, nearly twelve hours before. It came on at 7.30 P.M. with very little notice then in the sky to lead any one to expect such violent wind; in fact it was as clear as a bell in the heavens, though the gale was very strong. It continued twenty-four hours before it began to moderate; the ship lying-to under trysails, with every thing else furled. She was at this time off the mouth of the river Plate.

N. B.—If at Buenos Ayres when a Pampero is indicated by the Barometer, and the appearance of change of weather, as before explained, do not suffer a boat to pass between the ship and the shore, or you will be likely to lose both the boat and her crew.

By an extract from the log of H. M. brig, *Raleigh*—August, 1835,* the indications of the Barometer in and before a typhoon, were—

Date.	Time.	Thermometer.	Barometer.	Winds.	Remarks.
1835. Aug. 4	8 A.M.	82	29. 60	N. b E.	7. 30 Hurricane.
	Noon.		29. 45	S. E.	
	8 P.M. Midnight.		29. 36 29. 04	N. N. E. E. N. E.	Typhoon increasing.
Aug. 5	3 A.M.		28. 50	E. S. E.	3 Typhoon veered to E.S.E. 9. 30 ship hove on her beam-ends. Cut away rigging. 9. 50 she righted, with loss of masts.
	6 A.M.		28. 20		

This vessel was then in the Chinese Sea, between Macao and Formosa—the Barometer gave indication of the typhoon, and every thing that bravery, coolness, and seamanship could do to avert injury from the storm, was done by the captain, officers, and crew. The typhoon came on from N.N.E. at 7. 30 P.M., on the 4th of August, at 10 P.M. it veered to E.N.E., and at 3 A.M. on the 5th of August, it again veered to E.S.E.—at 6 A.M. the Barometer was at its lowest, 28. 20. At 9. 30 the ship was hove on her beam-ends by the wind and sea; and on the crew, with most praiseworthy coolness, cutting the laniards of the rigging, the ship righted with the loss of her lower masts and bowsprit, and they succeeded in saving her.

* See Reid's Law of Storms—[page 260.]

In the North Atlantic and on the coast of North America, gales begin at S.E., go southward, get S.W. with heavy rain, and fly in to N.W.

To meet such gales, vessels ought to be on the starboard-tack.

In the West Indies, hurricanes begin from the eastward, and proceed westward, inclining northerly, and leave off at the opposite point to that in which they began; therefore vessels ought to be then on the port tack.

In a typhoon, (such as the Raleighs,) the wind was N.N.E. first, then E.N.E., and afterwards E.S.E.

To encounter this tempest, a vessel should be on the starboard-tack.



GENERAL RULE FOR LYING-TO IN HEAVY GALES.

As a general rule therefore, if a tempest is expected, whenever the wind begins to head, *wear ship*, as the opposite tack will be the safest for the ship to be on; so as to come up instead of being headed off, and probably taken aback, which in violent winds and high sea is so dangerous.

TO LESSEN THE CASUALTIES TO FISHING BOATS AND THEIR CREWS ON THE COAST.

At fishing stations, let some appointed person, from

the indications of a good Barometer, hoist at a staff, when Barometer is—

Barometer.	Signals.	Signification.
29. 40		A gale threatened.
29. 0		It is dangerous to be at sea.

With such simple cautions their safety would be much increased.

PART II.

DUTIES OF COMMANDERS.

Every person in charge of a merchant vessel, should adopt the three following words, as a rule of conduct, and the constant objects to be attained,—

First—SECURITY.

Second—SPEED.

Third—COMFORT.

They naturally place themselves as they here stand.

The first, as the most important, ought never to be lost sight of.

The second is the next object to be sought ; and

The third ought to be studied for the benefit of all on board, in as great a degree as the two first will permit. No one who has been in a ship, need be told how entirely the comfort, as well as security, of all persons on board depend not only on the ability, character and conduct of the captain, but even on his temper and arrangements.

Let every person in the vessel be at all times furnished with a waist belt, a fathom and a half long, (made gasket-fashion, with a flemish eye.) When it is necessary to take in the third reef of the top-sails, before it becomes dark, let a three and a half, or four inch life-line be set up fore and aft on each side of the upper deck, with a few frappings to guy it to the side and a midships. ORDER the watch, or hands, to wear their belts, which is simply done by being rove round the waist, with the end tucked in, and does not in the least interfere with their active duties, either on deck or aloft. But when men are then employed in conning, steering, looking out, or in any exposed or dangerous position, they may take two half hitches with the end of their belt, which at once secures them from being washed away—an accident which very frequently occurs from a loup of a sea, broaching to, being taken in a sudden squall, pooped, or any other casualty to which seamen are constantly exposed.

ON THE GULF-STREAM AND ICEBERGS.

In the early part of the summer, on voyages to and from North America, it is very necessary to use the Thermometer in order to ascertain the temperature of the water, as by so doing, you may ascertain your proximity to icebergs, and avoid them at night. At such time the Thermometer should be used as frequently as the log.*

When in the vicinity of icebergs, the water will become many degrees colder than before—therefore

* See 'Blunt's Pilot'—[page 259.]

when its temperature is tried often, should a depression of several degrees take place suddenly, *ice is near*—and if so, the canvass should be made snug, a very sharp look out kept, and all be made quite ready for rounding-to, wearing or tacking; and if very dark, do so at once, and wait for day-light.

The Thermometer will at all seasons inform you when you are in or out of the gulf-stream; and this may be useful to know, in order to avoid the current, if you are bound to America; or to take advantage of the current, and keep in it, if bound to Europe. Its rate is often as much as fifty or sixty miles a day. In the gulf-stream, the water is warmer than the air—and out of the stream, the air is warmer than the water.

WATER SPOUTS.

A water spout appears like a speaking-trumpet, with the small end downwards. It is said the concussion caused by firing guns, is likely to disperse it. If one should be near, and likely to break on board, clew up and furl all, (see the top-sail-clew-lines are afterwards belayed,) batten the hatches, have scuppers clear, and pumps ready.

SQUALLS.

They usually give some notice by gathering up black in the horizon.

If the darkness rises up, and thins away in the bottom, it will not be strong.

But if it still continues thick in the horizon, expect wind.

Shorten sail before it comes home.

Clouds high, with hard edges, denote dry and strong wind.

A large halo round the moon, betokens high wind.

Be guarded when clouds pass overhead ; the strength of the wind is then very often the most felt.

TAKEN IN A SQUALL.

A vigilant look out, will usually prevent your being taken by a squall in an unprepared state.

If taken in a squall with the wind on the beam, before it, or close hauled, keep your luff, and lower away, and clew up all as fast as you can. In doing so the ship will be relieved, and the canvass got in better than if the helm had been put up.

But if taken in a squall with the wind abaft the beam, putting the helm up, and running away from it, as well as shortening sail, will be then the readiest mode of easing the ship.

ON GOOD ORDER.

In a man-of-war, discipline is productive of the greatest good—the energies of all are called for, and employed as most required ; but even without martial law good regulations might, and ought to be established in every ship, at all times, and in all places.

The greatest assistance to the promotion of good order, would be SOBRIETY in British seamen. The few

shades in the sterling qualities which belong to them, many of their irregularities and acts of insubordination, may be traced to intemperance. They might abstain perhaps, but they cannot refrain. If owners would give 4*s.* a month in lieu of spirits, and have a mutual agreement respecting its use abroad, with a stipulated penalty for drunkenness, ships might be managed much more safely, and with greater ease and economy than at present; half the work of discipline would then be effected.

Where the men are sober, have entire confidence in their officers, and are well treated, not harassed unnecessarily, and see that the comforts they ought to have are properly attended to—I think it would be found in most instances, that effective good order would establish itself. Where it does exist, the vessel's services are rendered in every way more effective and beneficial to her employers, as well as more agreeable to the officers, crew, and passengers if any, and her chances of casualties considerably lessened.

The remedy too is in great measure in the hands of ship-owners and captains themselves; for if they required certificates of sobriety before they would ship men, drunken ones would either remain unemployed or become sober,—for even a sober landsman, is more useful than a drunken sailor.

ON CLEANLINESS AS REGARDS THE PRESERVATION
OF LIFE IN VESSELS.

Nothing is too trifling for an officer's attention, that tends to the health and benefit of those dependent on his care and forethought.

Every vessel should be pumped out *morning* and *evening*.

A clean, sweet, and dry hold is essential to the health of the crew.

Nothing can be more injurious than for men to sleep over bilge-water, which must be the case if any water is left in the hold at night.

The hold ought to be cleared often, and when it is, it should be white-washed; and also the between-decks frequently white-washed.

ON PAINTING.

In tropical climates, avoid painting as much as possible, particularly in-board.

ON HEALTH.

In port in tropical climates, give the men a little coffee before they go to work in the morning.

The inconsiderate indulgence in new rum, has been one great means of increasing the numbers attacked with yellow fever.

Do not allow the men to lay about in night dews; and particularly not to wait about at wharfs.

Allow the men the use of fresh water whenever it can be spared, for washing clothes, and also for themselves.

ON STRENGTH OF CONSTRUCTION AS CONDUCTIVE
TO SECURITY.

The bottoms of H. M. vessels are filled up solid between the timbers, and caulked as high as the water line; the consequence is that, if a vessel meets with injury from getting aground, she may lose the outside planking without getting a material leak; and is also so strongly built that, even if entirely wrecked, she would not go to pieces for so considerable a time, that the greater part, if not the whole of the crew would most probably be enabled to save themselves.*

ON FITTINGS.

All vessels should be fitted with lightning conductors.†

BOATS.

Every vessel should have at least one boat fitted as a life-boat.

Steamers should also have Capt. Smith's paddle-box boats.‡

* See H. M. S. *Success*, 1829—'Nautical Magazine for 1834, page 334; and H. M. S. *Pique*, 1835—'Nautical Mag. for 1835, page 755.

† Mr. Snow Harris' valuable reports fully prove this necessity.—See Extracts, Nautical Magazine, 1843, and previous volumes.

‡ The late losses in steamers shew how much these are required.

In vol. III. page 364—"Hall's Travels in North America," he mentions that, in steam-boats on the Mississippi, at twelve or fourteen feet from the stem, they have a *strong bulk-head* run across the hold from side to side as high as the deck, and reaching the keelson : this bulk-head is caulked and made water-tight. If the vessel gets a hole in her bows, the separation prevents the rest of the vessel from filling. This bulk-head would be very desirable in *all steamers* ; and if a common pump were placed in this compartment, the means of keeping it free from water would thus be also ready.*

FIRE PUMPS.

Fire pumps and hoses, (such as Hearle's of Devonport,) should be fitted to all vessels—or some other fire engine be provided.

CORK JACKETS.

On the supposition that every possible means should be provided to save the people in case of wreck—every vessel should be supplied with a certain number of Andrew's cork swimming belts, (Manchester.)

LIFE-BUOYS.

Life-buoys, or some substitute should be in every vessel, ready in the event of a person falling overboard.

* Had this contrivance existed in Solway, Pegasus, and Queen, the results might have been less fatal.

PART III.

OBSERVATIONS ON NAVIGATING.

The practice of navigation in its present improved state is rendered so easy and simple, and so perfectly attainable by every person who has received a plain education, that it appears surprising it is not more generally understood. It would be well if owners were more particular in requiring two or three expert navigators to be in every vessel.* The officers themselves who have not the advantage of being so, should take the necessary steps to learn that useful part of their profession, without which all their other abilities may be insufficient to conduct the charge entrusted to them with safety.

In all ports there are to be found able teachers, both

* A loss sometimes occurs, and no vessel ought to be dependent on one person only. I once fell in with a merchant brig, two hundred miles from her port, (she was from the West Indies,) whose captain had been washed overboard, and the mate had died from fever. She was four degrees out in her longitude, and was also a degree out in her latitude. Large as these errors may appear, they are not uncommon.

for taking and working all the necessary observations ; to them I earnestly recommend all such officers to go, when they have the opportunity ; we are never too old to learn, and should not be deterred from doing so when a little attention would render our services so much more valuable. I would further recommend those who are tolerable navigators, to lose no opportunity of keeping themselves up to the improvements of the day.

By a good navigator, I mean one who is capable of taking himself all the different observations required at sea for ascertaining latitude and longitude, and also has the knowledge and is in the practice of working out observations *correctly* and *quickly*, without being dependent on any assistant, but one to take the time and note the observations.

The modes of ascertaining a ship's place at sea are

First, by dead-reckoning ;

Second, by observations.

The dead-reckoning may be, with attention, sufficiently correct for ascertaining *nearly* a ship's position between the times of getting it from observations ; but such a reckoning is not to be depended upon for more. It always requires the proper allowances to be made for the variation of the compass, lee-way, currents, and tides.

TO OBTAIN THE LATITUDE BY OBSERVATIONS.

First, the meridian altitude of the sun ;

Second, double altitudes (in high latitudes) ;

Third, single altitude near noon ;*

Fourth, Polar star (if horizon is *good*) ;

(The three first are indispensable.)

To obtain the longitude, the only correct methods are

First, by chronometer ;

Second, by lunar ;

as without the chronometer and lunar observations there are no means of obtaining the longitude at all correctly at sea, it is not too much to say that, no vessel should attempt to navigate without being assisted by both.

FOR THE LATITUDE.

The meridian altitude of the sun should *never* be omitted when it is clear enough to be taken.

When sailing to the eastward, it is necessary to look out a few minutes earlier or you may not be in time.

DOUBLE ALTITUDES.

In high latitudes, and particularly within a few days sail of your port, make a point of taking sights for double altitudes *every* day ; the sun may not be visible at noon, but notwithstanding you will then be able to get your latitude. The trouble of looking out for even an hour or two should never interfere with so essential a duty.

* See *Norie's Epitome*, page 202.

A SINGLE ALTITUDE NEAR NOON.

It often happens that in catching weather a single altitude near noon may be obtained; and it is very desirable to take advantage of it, as with one sight, and the time from noon nearly, the latitude can be worked out very correctly.*

If the sun does show at noon in these cases, you do not require either the double or single altitudes to be worked; but if it does not, you are still able to ascertain your latitude from one or the other, and have thus three chances instead of one for so doing. The careful navigator should take advantage of all he can. In coming towards Europe, in the winter, he requires all the assistance he can obtain from observations; with attention however, and the trouble of looking out, (which ought never to be considered,) it will be but seldom that a sight for the latitude may not be obtained. You may often catch a sight of the sun in the quicksilver part of your horizon glass with a plain tube, quite close enough to get the latitude very nearly; when out of the quicksilver, and with a telescope you would not get an observation at all.

POLAR STAR.†

In a high north latitude, if the sun has not been observed for the latitude, you may yet get a bright night and good horizon—if so observe the polar star.

* See *Norie*, page 202.

† For rules, see *Norie*, page 190—and also *Nautical Almanac*.

It is desirable to keep the horizon glass of your sextant or quadrant *well* quicksilvered.

A star must be brought to the horizon without a tube, and then insert the tube. (I found one with a bell-mouth the best for stars.)

I recommend those who have not practised taking the polar star, to do so repeatedly when they know their latitude well, merely to see how close it comes, and the practice will give them confidence in its accuracy, when it is absolutely required. The observation is easy, and the work very short and simple.

LONGITUDE.

ON CHRONOMETERS.

The management of this instrument is very simple, and its use so essential that, every vessel intended to go out of sight of land, should have one chronometer or more on board; and the officers ought to know well how to use it. The chronometer should be kept in a very secure place, and one where the time can be taken without moving it. It should be carefully wound at 8 A.M.,* in the presence of the officer of the forenoon watch, before he relieves the officer of the morning watch, who ought to ascertain that he has done so.

A sight† for the chronometer should be taken every

* The watch being kept immoveable in the *left* hand while being wound.

† When sights are taken, let a boy with a light mallet be placed on the upper deck over the chronometer, to give two taps when the observer calls "look out"—and *one* tap at the word "stop."

forenoon, or afternoon ; about 9 A.M., or 3 P.M., or nearer noon will do. Every officer should *take*, as well as *work* his own sight, so that the entire work of each person might be quite independent.

Chronometer sights,* however, should not be worked when the latitude has not been obtained by observation ; as an erroneous latitude may occasion fatal mistakes.

A false horizon should be on board, to enable the captain, or first mate to take sights when abroad, to ascertain the error of the chronometer, and its rate for the homeward voyage. This is an easy but very essential operation, and only requires a little practice.

ON LUNARS.

It must be always recollected that, chronometers, however good, are a mechanical contrivance, and as such liable to accident or derangement ; consequently, to navigate *well*, it is necessary to have recourse to a lunar observation every ten days or fortnight, which will serve to test the accuracy of the chronometer.

It is said that the longitude deduced from a lunar observation is not to be depended upon nearer than half a degree. I have however usually found it to come within half that difference.

The chronometer may be also tested by the dead-reckoning ; as should there be found any material variation in the ship's difference of longitude, in a day's work, between the log and the chronometer, an error may be then suspected in the latter, which a good lunar

* Work only to minutes of longitude ; (be however very correct in the working ;) to seconds may be required in an observatory, but not at sea.

would determine. A very few months, with attention and practice, will enable any one with a good eye and steady hand to take correct lunar distances. The officers in the East India Company's Service have deservedly had the reputation of being very expert lunarians and excellent navigators.

I recommend those who have not practised taking lunars* to do so, as *one* of the only two means of ascertaining their longitude with any certainty.

When a lunar is taken, if you have a chronometer on board, it is not necessary to work out the time at the ship for the lunar, but to note the time by the chronometer only. Find the error of the watch on mean time at the ship, when the chronometer sight is worked; apply this error to the time shewn by the chronometer when the lunar is observed, which will give the mean time at the ship. The same difference of longitude must be applied to reduce the longitude to noon, as is applied to the sight for the chronometer.

ON WORKING UP THE SHIP'S PLACE.

The first duty at noon should be to work up the ship's place, and, if the meridian altitude and a sight for the chronometer have been taken, the ship's place would be known by one bell. It should then be an invariable practice to mark it off on a general chart—

* An upright telescope (if a good one) will do very well; be sure of a good contact of the limbs. The inverted telescope magnifies more, but requires less motion of the vessel than is usually to be had, and longer practice. You cannot be too particular in reading off.

the habit of always doing so suggests many useful hints to the navigator which might otherwise escape his attention.

VARIATION OF THE COMPASS.

The taking and working azimuths and amplitudes are in these days but little required by the general navigator; the variation of the compass, in all parts, is given with much accuracy in the *Epitomes of Navigation*, and is also generally found on charts. *Barlow's Chart of Magnetic Curves* is very useful in giving correctly the variation of the compass in all parts of the world.

Recollect that westerly variation is to be allowed to the left of the compass courses; and easterly variation to the right.

TIDES.

Every officer is required to work the time of high water, *Norie's* second method, [page 169,] is a good one; it is not, however, often required, as tide-tables are so general and correct.

It will be seen that I attach all the importance of navigating

To the three methods of finding the latitude from observation—(viz., meridian altitude, double altitude, and single altitude)—and to the only *two* known

ones of obtaining the longitude, (viz., chronometer and lunar,) as the dead-reckoning* can only be considered an ingenious mode of guessing, and, for the important object of knowing a ship's position on the ocean, not one to which she ought to be abandoned.

SCHOLAR APPRENTICES.

A lad, such as one of the Greenwich scholars, (who has been taught navigation, and is furnished with a sextant, &c.) would be found a most valuable assistant in navigating vessels. He could always take the time, or look out for sights and work them, even when the officers might be unavoidably prevented doing so; he would also be learning practical seamanship, and thus be preparing himself to become a useful mate.

ON MATES.

The efficiency of mates as officers might be much increased if the Admiralty were to sanction their serving for a year in the royal navy as master's assistants—a few in each ship. They would there have an opportunity of learning more of the duties of officers, and would see the advantage of order and discipline, the great attention that is paid to navigation, and the best system of cleanliness and ventilation; all objects of very great importance.

* [See page 15, on 'Currents.']—In that case the ship was 240 miles out of her dead-reckoning, (nearly six degrees of longitude,) in six days!

Every officer should be required to have a sextant, (its price now is so low that no one should be content with a quadrant,) as it will serve for taking lunar distances; he should also have an Epitome of Navigation.

All vessels ought to be found in a Sextant, Chronometer, Barometer, Thermometer, Nautical Almanac for the year, and the following one if required.—These should be ship's stores.

ON PILOTING.

Every officer should endeavour to obtain what information he can on the stations, coasts, and harbours which he frequents, respecting winds and weather, currents and tides, appearances of the land, and marks by which he may recognize it, and also its shoals and dangers. This information is most useful, and no one can tell how soon it may be required.

I would advise officers always to make notes on such subjects.

In going in and out of harbours and anchorages,—

1. Consult the best charts and books of directions.
2. Ascertain what shoals and dangers.
3. ———— what buoys and marks.
4. ———— leading marks in and out.
5. ———— turning marks.
6. ———— marks for anchoring.
7. ———— how to lay anchors and moorings.
8. ———— tides and prevailing winds.

Ten minutes attentive examination of a good chart, and half an hour's study in a book of directions, will be time well occupied.

When land is in sight, the bearings and distance of some known point should be taken every four hours at least, and entered in the log.

CHARTS AND BOOKS.

Every vessel should be supplied with late editions of charts* of

- 1.—The English Channel ;
- 2.—North Atlantic ; and
- 3.—Particular chart of the coast to which she is bound.

FOR PILOTING

The following books are required :—

Channel Pilot ;
Light Houses, British Islands ;
Directions, North Atlantic ;
And book of directions according to the station employed, such as
Blunt's American Pilot ;
Colombian Navigator, (with Owen's late corrections ;)
Directions, Coast of Brazil ;
Or some other as may be necessary ;
Parallel Ruler ; and Pair of Compasses.

* Those supplied by Norie and R. B. Bate are excellent.

GENERAL CAUTIONS IN ANY VERY INTRICATE NAVIGATION, (*such as old Bahama Channel, &c.*)

Anchor at night or when in doubt.
 Take frequent and short departures.
 Pay particular attention that the proper course is steered.
 Hand in the chains, and lead kept going.
 Good look out.
 Anchors ready, and cables clear.
 Canvass well regulated and be ready for bringing up.
 Boats ready, tackles at hand.
 Stream cable and hawsers ready.
 Top-gallant-mast-ropes rove.

ON SOUNDINGS COMING INTO THE ENGLISH CHANNEL.

Every vessel should be supplied with a Patent Sounding Machine,—Massey's, or some other; you will get your soundings more correctly with it, (if the line is not checked,) and need no guessing for stray line, if they have not been struck when quite up and down; besides, under thirty fathoms, you need not bring to for a cast.

Always have an arming on the lead.

Get the Lizard to bear E. $\frac{1}{4}$ S. (compass) that is E. N. E. true.

The best course for coming into the channel is E. $\frac{1}{4}$ S. by compass.

With that bearing of the Lizard, and on that course you *must* sight either Scilly, the Lizard, or the Eddystone.

ON SOUNDINGS COMING INTO THE ENGLISH
CHANNEL.

With a southerly wind you may allow $2\frac{3}{4}$ points for the westerly variation of the compass; and only $2\frac{1}{4}$ points with a northerly wind.

With easterly or westerly winds $2\frac{1}{4}$ points will be found to give the truth nearly.

The parallel of 49. 30 is considered the best latitude for entering the Channel with.

Try for soundings as soon as you consider you are on them; the colour of the water will generally give you notice of this.

In $49^{\circ} 30'$ north, longitude 10° west, you will get about ninety fathoms.

Get another cast eighty miles further east; in about $49^{\circ} 30'$ and longitude 8° you will then have about seventy-five fathoms, mud; or if to the southward of that latitude, sand.

Forty miles further east, in $49^{\circ} 35'$ and 7° west, the soundings are sixty-five fathoms, sand.

In that latitude, and in the longitude of Scilly, they are sixty fathoms; and nearer Scilly the ground is coarse.

Off the Lizard, the soundings are fifty fathoms; and nearly close up to the land, as much as forty-five and forty fathoms.

It may be seen from these few observations that entering the channel in the latitude of $49^{\circ} 30'$, the soundings very nearly give the longitude.

In longitude 10° W. 90 fathoms.

—————	8° W. 75	„
—————	7° W. 65	„

ON SOUNDINGS COMING INTO THE ENGLISH
CHANNEL.

In longitude 6° W. 60 fathoms.

5° W. 50 „

A vessel ought to haul in to the northward, when in fifty fathoms, and endeavour to make the land about the Lizard.

A CAUTION.

As merchant vessels are never employed to survey, all officers in charge of them should carefully avoid unknown channels, or those even not well known, and on no account attempt to make short cuts, with which they are not *perfectly* acquainted. If any circumstances or a positive necessity require the contrary, a vessel should be conducted, in such a case, with every possible care; that of being preceded by a boat, to sound a-head, being the first and most proper precaution which suggests itself.

Too much care cannot be taken in the selection of officers to command vessels, particularly in their qualifications of navigating and piloting.

PART IV.

MEETING AT SEA.

Ships often omit to make the proper enquiries when passing within hail. Those most required are—

“What ship?”

“Where from?”

“Where to?”

“Our longitude is—”*

“Will you report us to Lloyd’s?”

“What news?”

“Can you spare any newspapers?”

“What winds have you had?”

(Be careful of quarantine before boarding.)

* Keep a small board, painted black, on which chalk the longitude you are in. Always shew this on passing vessels, it will either correct or confirm their or your reckoning, and is a proper and useful civility. The French reckon their longitude from the Meridian of Paris in $2^{\circ} 20'$ east of Greenwich; the Spaniards theirs from Ferro in $17^{\circ} 56'$ West. On “shewing longitude at sea”—see *Nautical Mag.* for 1835, page 401.

Every vessel should be furnished with Marriott's signals,

A set of flags to correspond,
And a spy glass.

TO AVOID COLLISION.

To begin this subject, I cannot do better than give a copy of the Trinity Board notice, of 30th October, 1840.

NAVIGATION OF STEAM VESSELS.

(COPY.)

TRINITY HOUSE, LONDON,
30th October, 1840.

The attention of this Corporation having been directed to the numerous, severe, and, in some instances, fatal accidents, which have resulted from the collision of vessels navigated by STEAM; and it appearing to be indispensably necessary, in order to guard against the recurrence of similar calamities, that a regulation should be established for the guidance and government of persons entrusted with the charge of such vessels; and,

Whereas the recognized rule for sailing vessels is, that those having the wind fair, shall give way to those on a wind:—

That when both are going by the wind, the vessel on the starboard tack shall keep her wind, and the one on the larboard tack bear up,—thereby passing each other on the larboard hand:—

That when both vessels have the wind large or a beam, and meet, they shall pass each other in the same way on the larboard hand, to effect which two last mentioned objects the helm must be put to port:—

And as steam vessels may be considered in the light of vessels navigating with a fair wind, and should give way to sailing vessels on a wind on either tack, it becomes only necessary to provide a rule for their observance, when meeting other steamers, or sailing vessels, going large:—

Under these considerations, and with the object before stated, this Board has deemed it right to frame and promulgate the following rule, which on communication with the Lords Commissioners of the Admiralty, the Elder Brethren find has been already adopted in respect of steam vessels in Her Majesty's Service, and they desire earnestly to impress upon the minds of all persons having charge of steam vessels, the propriety and urgent necessity of a strict adherence thereto, viz.

RULE.

When STEAM VESSELS on different courses must unavoidably or necessarily cross so near that by continuing their respective courses, there would be a risk of coming in collision, each vessel shall put her HELM TO PORT, so as always to pass *on the LARBOARD side of each other.*

A STEAM VESSEL passing another in a narrow channel, must always leave the vessel she is passing *on the LARBOARD hand.*

By Order.

(Copy)

Signed, J. HERBERT, Secretary.

Strict attention to this notice should be given on all occasions, and the doing so would be the means of averting many accidents; it relates to all sailing vessels as well as steamers.

A good look out should be kept at night.—

As soon as it is dark *every* sailing vessel should carry a light under the fore-top; this should be a rule, and not even left optional.

If this light were carried in a lantern with green glass, the distinguishing light of a sailing vessel would be known.

Steamers on the coast usually carry paddle-box lights, as well as a mast-head one.

The sea-going steamers mostly carry two horizontal lights.

(They are therefore easily distinguished.)

Sailing vessels ought always to have a light kept on deck, (in a tub or bucket for shading it,) ready to be shewn, as steamers sometimes come up astern.

A musket, loaded with blank cartridge, is useful as a signal to call attention, and should be kept ready at hand.

A vessel on the starboard tack should show a light at the lee cathead.

A vessel on the port tack should show a light at the weather cathead.

If in a tides way, and in less than ten fathoms, the headmost one should anchor, either with a stream or bower, as most convenient.

If in soundings from thirty to ten fathoms, the headmost vessel should drop a kedge anchor.

If vessels get foul of each other in deep water, (should the weather be sufficiently moderate,) get a boat ahead of the headmost, and another astern of the sternmost one, and tow apart in opposite ways.

If a vessel anchor too close in another's hawse, the one next ahead of her should send her a tow-line, with which she might pass a hawser on board, to enable her to warp clear. ●

NIGHT SIGNAL IF IN DISTRESS.

A general night signal is much required to signify "In distress, and requiring assistance,"—it should be universal.

A CRIMSON light, burnt as a blue light now is, might be adopted for that purpose.

I see Robinson's Night Signals are advertised, but I do not know whether his are intended for the purpose I have named?

Men of war fire minute guns for that purpose; they use blue lights to shew position, and rockets to call attention.

* First endeavour to bear clear, if that cannot be done, then see directions.

As no vessel can be expected to enter a port unless she sees the coast or lights, the following should be a rule with all vessels, steamers as well as sailing vessels, in a fog.—

When the distance is *nearly* run, but not too close, lay-by with the ship's head OFF SHORE, with no more than good steerage way, until it is clear enough to proceed. In fogs, or when it is thick, do not make too free with the land, or use intricate or dangerous channels.

When in doubt, stop or anchor: delay is better than loss.

Use the lead frequently.

All steamers ought to be furnished with a *gong*, which should be sounded every four or five minutes, or oftener.

Sailing vessels should sound a *conch* shell* or a horn on the starboard tack; and the ship's bell be rung frequently, or a drum beat, on the port tack.

The having signal guns at lighthouses would, in many situations, be attended with advantage. At Sambro lighthouse, Halifax, Nova Scotia, Admiral Sir George Cockburn established a regulation by which the men of war were frequently able to ascertain their position in a fog. The ship, when she supposed herself within hearing of the lighthouse, fired a signal gun; if heard at the lighthouse, it was immediately answered by two guns fired in quick succession.

Boats should not be allowed to leave a ship in a fog.—If it be necessary, a pocket compass, a few pounds of biscuit, and a keg of water should be put in

* Off the coast of Nova Scotia, the fishing vessels blow a conch shell, (having the upper end cut off,) as a signal in fogs; it is heard at a considerable distance.

the boat. In a fog, should a boat be passing between vessels tolerably close, the crew might take the end of the log line before it shoved off. I have known boats missing for a length of time in fogs.

"MAN OVERBOARD."

GENERAL DIRECTIONS.

When this accident occurs, (should a vessel be on a wind, and the weather moderate,) call the "hands about ship;" put the helm down and heave in stays, "up courses," and lower down a boat as soon as the ship has lost her way, and, before she can gather stern way, haul the after-yards, and leave the head-yards a box; it may be necessary to fill them afterwards to close the boat.

Station a lad in each watch to catch and keep a sight of the person in the water, and let one go aloft to retain it; a cabin boy might also assist in doing this. It is most essential that the person should not be lost sight of.

The officer of the watch must see the helm is well attended to.

If sailing free with studding sails set, "let go top-mast and top-gallant-studding-sail tacks," "trip up lower studding-sails," "lower royals," and bring the ship by the lee first, and then to the wind, with the main-yard braced up; lower a boat as soon as the ship has lost her way.

To explain this more fully: if the wind is on the

larboard quarter, bring the ship to the wind on the starboard tack.

If the wind is on the starboard quarter, bring the ship to the wind on the larboard tack.

In each case brace the main-yard up, and leave the head-yards square or a box.

If the wind is right aft, come to the wind on that side on which the person has fallen.

After the studding-sails are in and unbent, it may be necessary to fill, and tack to near the boat.

Stern boats are the most dangerous either to lower or to hoist up; and with stern way are still more so.

On hoisting up a stern boat, the bow should be brought to the weather side of the ship; let a rope be passed into the boat from the weather quarter.

When a boat is lowered from the quarter, or hoisted out from a midships, a rope should always be passed into her from *before* the fore-rigging: the boatswain might do this. Many accidents occur from the bow tackle being unhooked before the after one, if no bow-fast is in the boat.

Boats to be hoisted up on the quarters ought to have bolts through the thwarts and keel, to keep them upright.

All vessels ought to have on board a copy of the Humane Society's directions for the recovery of persons apparently drowned.

STATIONS.—"MAN OVERBOARD."

Let every man know his station in such an accident.

The tinkling of the bell might be the signal to call the people on deck.

Endeavour to throw the person a rope before he has passed the vessel, and if she has not fresh way, he might be able to hold on until he could receive a bowline knot, or some assistance.

Station one man to drop the life-buoy; if this person uses judgment, he may drop it near the person requiring it.

Let the carpenter or any other man, throw a grating as near as he can to the person in the water, being careful not to strike him.

The chief mate and four men or boys should be stationed to a boat—two to the falls for lowering, and two in the boat with the mate, giving each person his own place; the boatswain to attend at the davits, to lower her as soon as the ship has lost her way; should the boat require four hands, the two who have lowered her can go down by the falls.*

The rest of the crew must go to their stations “about ship” if on a wind, or to their stations for shortening sail if going free.

Two or three times exercise and explanation would make every person know his station; all must be sensible how humane and necessary a duty it is, and would no doubt give it all the attention it deserves.

Every officer in charge of a vessel should always have the best arrangements made for saving any person who has fallen overboard; to do this—

First, a life-buoy ought to be in readiness by night and by day.†

* The hook and thimble should be fitted to work as easily as possible; perhaps if the thimble were seized into the lower block of the fall, and the hook to the slings or bolt, they would be more convenient for unhooking when the boat is down.

† Cook's life-buoy is excellent, and is fitted expressly for night and day use.

Secondly, a boat should be prepared for lowering or getting out at all times.

And thirdly, the rest of the crew should be stationed to their duties, either for tacking or shortening sail, as may be required.

Most vessels can carry a light boat on the quarter; and if they have two pair of handy *davits*, they might generally manage to have a small boat* on the lee quarter, ready for lowering in moderate weather; a preparation of this sort would save many a fellow creature's life. In assisting a person into a boat, do it over the stern or bow, but not on the broadside, particularly with a small boat.

Judgment must be used not to risk a boat's crew when the wind and sea are high, as of course the attempt can then only be made from the ship to save a person in the best manner possible.

ON FIRE.

A talented officer thus writes on the subject.—“We
“ now come to the most important of all the regulations
“ in a ship, namely, those which operate against the
“ fatal and shocking effects of fire. Whatever good
“ results from stationing people in ordinary cases can-
“ not be put in competition with this, which provides
“ against the most dreadful catastrophe incident to a
“ ship. From the number of unfortunate accidents of
“ this nature we surely ought to be prepared to our
“ utmost for such an event,
“ First, by internal precautions; and

* A fourteen feet dingy or jolly boat is a good sea boat.

“Secondly, by the means to be used against the “danger.”

Let there be great attention in the use of fire and lights.—The regulations on these subjects which exist in men of war are still more required in merchant vessels.

Fires* should be put out at eight P.M., and all lights at nine P.M., except those required for the binnacle, and on deck.

The officer of the last dog-watch ought to report the fire extinguished to the captain.

As each man is relieved from the wheel, he should examine below, and report “all well” to the officer of the watch.

No naked light whatever ought to be permitted; let either lanthorns or lamps be used.

Spirits should be drawn off by day; a naked light should on no account be permitted near a spirit cask.

Smoking should not be allowed below. I have known more than one ship set on fire by a man’s pipe; and by cigars, I have no doubt many have been burnt.

In stowing a hold, do not allow naked lights to be used, nor any person to smoke there when so employed.

On receiving cotton as a cargo, both those who ship as well as those who receive it ought to ascertain that it is in a safe state before it be put on board.—I have known instances of its being sold and moved away, when, in a few hours, if it had not been moved, it would have ignited.

I am acquainted with the particulars of a ship that was burnt some years since, where oil had been stowed

* Look at the regulations in docks, tiers, or in port. A ship, alone on the ocean, far more requires the most rigid attention to such regulations; they should be enjoined by owners, and enforced by captains.

in the hold with cotton over it, with what was considered safe and secure dunnage between. The cotton, notwithstanding, absorbed a quantity of oil, became heated, and ignited. The crew with difficulty saved themselves in the boats before the flames burst forth, and the vessel was entirely consumed.

Chests containing bottles of inflammable substances, such as vitriol, &c., cannot be too well secured. A regimental medicine chest upset in a gale may set fire to a ship.

Lucifer matches should never be allowed on board a ship.

The coals in steamers have frequently taken fire, and in many cases with the most fatal consequences.* Too much care cannot be taken in the selection of coals; a strict examination ought to be made as to their state when received and stowed, and no suspicious circumstances should be then overlooked. When receiving coals, avoid throwing the fresh ones on the old, which ought to be kept uppermost, and *first* for use. When once they become ignited, I can hardly offer a remedy for the evil.

A friend writes thus:—"I was on board the *Ferdinando Primo*, in the Mediterranean, when the coals took fire; some passengers threw water upon them, and smothered the fire by wet beds." Hot water, or steam, if they can be used, are more expeditious than cold water in extinguishing fire, I believe. To attempt to discharge the coals, would allow the air freer access, and would be certain to increase the power of the fire.

* The last reported loss from this calamity has been the ill fated American Steam Frigate, *Missouri*.

A few canvass buckets, with long lanyards, should be always prepared and ready on deck for drawing water.

When a fire is first discovered, shorten all low sails directly, courses up, stay-sails and wind-sails down, boat covers and hay bags thrown overboard.

If the sails should take fire from lightning or any other cause, cutting away the mast appears the most likely method of saving the ship.

At first, endeavour if possible to stifle the fire; which may be best done by shutting off any draught of air, and smothering it with wet bedding, small sails, &c., until a good supply of water can be applied.

If the fire is forward, put before the wind until it is necessary to "out boats," then bring-to.

If the fire is aft, or a-midships, keep to the wind.

STATION BILL FOR FIRE.*

Coolness and steadiness in any misfortune by fire are essential to arrest it.

If a fire break out below, the hatchways should be immediately covered, to prevent a draught of air.

Ring the ship's bell to call the men to their stations.

* This bill ought to be written out or printed, and hung up for every one's inspection.

MEN'S NAMES.	DUTIES.
A very steady man.	To the helm.
The carpenter, and one man.	First, to cover hatchways with gratings and tarpaulins. Secondly, to rig pumps and lead hoses ; and Thirdly, get the tools ready for cutting away, if required.
The chief mate, boatswain, and ship's cook.	To attend where the fire is, and pass water to it, &c.
A man of each watch, or more.	To the pumps, and to draw water as for washing decks.
A boy.	To collect all the buckets to the part where the water is being drawn.
Remainder of starboard watch.	First duty, to haul up courses, brail up trysails and spanker. Second duty, draw and pass water with the fire buckets—then for third duty see below.
Remainder of larboard watch.	First duty, to haul up courses, brail up trysails and spanker. Second duty, to soak small sails and bedding to throw over and smother the fire—then for third duty see below.
Cabin steward, and cabin boy.	If any powder or other combustibles are on board, to throw them over board if possible, or drown them.
Second mate to direct fire hose, and the supply of water from the deck.	If the fresh water is in tanks, turn the waste valves* of two of them for a first supply for the pump, and then go to direct fire hose, &c.

* The mate ought to have the key of the valves of the water tanks in his own keeping.

MEN'S NAMES.	DUTIES.
The crew.	Third duties of the crew, the yard and stay tackles to be got up ready for getting out boats.
The crew.	Fourth duties of the crew, If the fire appears to encrease, out boats, and lower down the quarter boats; let them lay off in a string to windward with a man and a boy as keepers, ready for the rest of the crew if required.
The captain.	To attend at all the stations as he deems best.

If the ship cannot be saved, the passengers and crew are the first objects, with some fresh water and biscuit; a compass, quadrant and epitome. Unless there is sufficient time, and it can be done without endangering the sea worthiness of the boats, nothing should be taken that is not essential to the mere preservation of life, and necessary for navigating the boats. [See taking to boats, page 68.]

ON SPRINGING A LEAK.*

Capt. A. Griffiths on Naval Economy, page 201, writes—"when the hour of danger and of need arrives, the period of precaution is past. The history of H. M. S. *Guardian* may be useful to us. After striking on an island of ice, and so damaging herself that her ballast actually washed out, and the ship sank in the water to the cells of her main deck ports, she was kept afloat

* See "Leak Alarm," Nautical Magazine, 1838, page 409.

for sixty days, traversed a tempestuous sea twelve hundred and thirty-three miles, and finally reached the Cape of Good Hope. Bound to Botany Bay, she was loaded with flour, and many water-tight casks of various supplies for the colony; and these casks being carefully bunged *floatated her*; the decks being shored up."

In Capt. Glascock's Naval Manual, Vol. I., page 194. Case—"If a ship has the flattest part of her bottom lying sixteen feet deep, (which is often the case,) the water then presses sixteen times as much upwards againts this flat part, as it does upon any part of the same ship about the water's edge; and so on to any other part, according to its depth. For example; suppose this ship to have four leaks, or plug holes, of equal size, that could be driven out occasionally; the first at *one foot* under water; the second at *four feet*; the third at *nine feet*; and the lowest at *sixteen feet* in the flat part of her bilge; that hole at *four feet* deep would leak or let in as much water again, in the same time, as that at *one foot* deep; and that at *nine feet*, three times as much; and that at *sixteen feet*, four times as much, though it run into the ship upwards; and so on in proportion to the square root of the height of the water above the leak or plug hole. Therefore, leaks in ships are more or less dangerous according to their depth under water."

"Suppose, therefore, that the hole of sixteen feet was quite at the *bottom* of the vessel, and that the water had risen in her twelve feet; then, as its surface is even with the four feet hole, those two which are covered will run with the velocity only of that hole in the four feet position, since four feet is the difference of the water within and without the vessel. Hence, if a ship spring

a leak under her bottom, although the water should increase upon the pumps at *first*, yet after it has risen to a certain height above the leak, the pumps will then be able to prevent its rising higher."

HOW TO DISCOVER A LEAK AT SEA.*

"The following rules may lead to the discovery of a single leak :—

First, should the ship increase making water as she sails, the leak is in the bow ; but if, on the contrary, she decreases making water as she sails, the leak is in the stern.

Secondly, if when sailing before the wind, the ship makes neither more nor less water, the leak is on either side; which side it is may be discovered by bringing the ship to the wind ; if the ship then makes more water, the leak is on the lee-side ; if less, it is on the weather-side.

It has been asserted that, by following round a leaky vessel, in a calm, with a pole, keeping one end applied to the ear and the other to the vessel's bottom, a rumbling hoise will be heard vibrating up the pole, if its end happen to pass near the leak. By this method the position of the leak may be discovered."

ON STOPPING LEAKS.†

"If we reflect on the present mode, so constantly practised, of watering by means of a canvass hose from

* Capt. Glascock's Manual, Vol. I., page 196.

† See Naval Economy, page 203.

the shore, through the salt water into the boat ; we can have little doubt of the retentive power of canvass. When it can be at all ascertained where a leak is situated, provided it be not too near the keel, or too much in the run ; that is, if it be in any part where you can bring a sail in *contact* with it so as to cover it, remember that a canvass hose when once saturated becomes tolerably water-tight. If part of a sail of No. 1 canvass be doubled, and brought by ropes to cover the leak, though it may not stop it, there can be no doubt it will materially assist in reducing it. This canvass must be *well* and *strongly* roped and stitched together, and it had better not be too large ; the smaller it is, (provided the purpose be answered,) the better ; as it will be less likely to be torn away. In placing it the rope ought to be outwards. This double canvass may be placed in its position, by ropes under the keel or out of the hawse-hole." A sail might be used for this purpose.

TO SECURE HOODEN-ENDS.*

"Very little trouble will be well bestowed in this case. While in dock, pay a rope out of the spare hawse-hole, take the end in on the opposite side and make it fast where, (when hauled turt,) it will best round the bow as you wish, and yet be secure under the fore foot ; then let that spot be noted down. Observe how far forward the dead wood extends, also the plumb line of the fore foot, &c. Pass a rope out of the inner

* See Captain Griffith's Naval Economy, page 172.

hawse-hole, with the end fast to the inner part of the stern port, haul it torth, and mark at what depth from the edge of the copper it touches at different places. Again, in like manner pass several ropes from five or six different parts on one side, (say before the fore-chains, at the chess-tree, before the main-rigging, abaft the main-chains, and abreast of the wheel,) under the keel, the ends being made fast on the opposite side; haul these torth, and mark how low down from the edge of the copper each rope continues to touch, or is in contact with the ship's bottom. Let *all* these circumstances be noted, as well as where it will be necessary to apply service in the wake of the keel, &c. All these points may be highly useful, particularly with reference to leaks. If never required, an hour thus employed can do no harm; but if ever wanted, when under difficulties, what a benefit!"

TAKING TO THE BOATS.*

The captain should in his own mind, and by a private memorandum, station the passengers and crew to the boats on board, and likewise make the persons here specified be responsible for having the following articles put into the boats.

* A few shilling boxes of concentrated meat lozenges in every vessel would be a useful provision in case of such an emergency; each man could then put a small box of them in his pocket, and thus have the means of sustenance for a few days. G. & F. Taylor, 17, Holborn, London, sell them.

Captain.	Compass, epitome of navigation, sextant, spy-glass, Nautical Almanac, pencils and writing paper, general chart, pocket watch, pair compasses, &c.
First mate.	Oars, masts, sails, boat hooks, bolt of canvass, boat's compass, epitome, chart, ensign.
Second mate.	Two or three bags of biscuits, some breakers of water,* quadrant, pencils and writing paper, half gill measure, a musket, box of cartridges, and flints or caps.
Surgeon.	Pocket instruments.
Carpenter.	Hammer, nails, sheet lead, grease, fearnought, oakum, saw, chisel, turn-screw, cold chisel, a phial of sweet oil, any small iron rod.
Boatswain.	Coil of inch rope, log reel, deep sea-reel, painted canvass, marling spikes, spunyarn, &c.
Sail maker.	Palm, needles, twine, fishing lines, hooks, painted canvass, boat's awning.
Servant and cook.	Tinder-box, flints and tinder, small box, lantern and candles, cheese, cabin biscuit, chocolate.
Each person.	A pannikin, a pocket knife, a change of flannels and stockings.

* A water or beer cock, with key, would prevent waste, and secure the issue of an exact allowance; the breakers ought to be prepared with the necessary tap-hole.

With a scarcity of food, savages attempt to lessen the cravings of hunger by tightening a belt round the waist, and by sucking a pebble they in some degree alleviate thirst. Chewing tobacco may also be serviceable under such circumstances. In such emergencies* all must fare alike.

ON REGULATING SAIL.

In high latitudes, during spring, autumn, and winter, when the weather is unsettled and the barometer low, it will be well to regulate the sails in preparation for a gale before dark; both masts and canvass will be saved by so doing. Every seaman has experienced the fury of a gale's coming on at midnight; and how much longer the men must be then exposed in reefing and furling than they would have been by daylight and before the breeze was at its height.

In strong unsettled weather, have boats well secured.

Have hatches battened down.

—— top-gallant-sails furled.

If a brig, have boom main-sail stowed.

Have treble reefed top-sails.

—— fore-sail reefed.

—— square main-sail furled.

—— trysails reefed.

* These emergencies occur but too often, and even whilst I am writing this the papers report the loss of the "Regular," Indiaman, in which the crew were compelled to abandon her and take to their boats.

Have spare wheel ropes and small axe aft, large axe forward.

- deck clear under midship boat.
 - good look out.
 - relieving tackles ready.
 - life-lines set up.
 - men to wear waist belts, (see page 28.)
 - musket and light ready.
-

TOP-MAST CARRIED AWAY.

I recommend vessels to use curb chain for parrals for top-sail-yards; let it be wormed, parcelled, and covered with leather; the seizings must be frequently examined. Carrying away a parrel may occasion a serious loss of life, should there happen to be any men on the yard at the time; and even if there are not, this accident is very likely to carry away the top-mast.

Funnels for top-gallant rigging are frequently used; for top-mast rigging, they are also very serviceable; and if a top-mast is carried away, the funnel is then invaluable, as the top-mast may be shifted so much more quickly, the rigging remaining properly placed.

CLEARING THE WRECK OF A TOP-MAST.

Watch on deck to secure the wreck and prevent its doing injury.

Watch below to shorten sail.

CLEARING THE WRECK OF A TOP-MAST. 71

Hook top blocks, reeve in them two hawsers, the stoutest to leeward, for passing round and securing the wreck in order to get the rigging, &c., in board.

Hook luff tackles in the lower pendants.

Let the other top-gallant yards be sent down, and the top-gallant masts housed, until the top-mast is shifted. If it be a fore-top-mast that is carried away ease in the jib boom.

Cut the lanyards of the topmost rigging, securing the dead-eyes by studding-sail halyards.

The weather hawser may be employed to unfid the stump.

CARRYING AWAY A JIB-BOOM.

Send down fore-top-gallant-yard, and house the fore-top-gallant-mast.

Use the fore-top-mast-stay-sail halyards and lee fore-bowline for securing and getting in the wreck.

TO FISH A LOWER YARD IN THE SHORTEST TIME.*

“Incalculable are the evils which may result to a vessel from the “springing” or snapping of a lower yard, especially the *fore* one.”

If the yard be severed, get both pieces down on deck,

* Capt. Glascock's Manual, Vol. I., page 198.

and place them together, to assume, as nearly as possible, their original position. Hollow out, so as to fit the cylindrical surface of the yard, two spare anchor-stock pieces, (or two proper fishes always fitted, and to be kept as spare stores,) in doing which a depth of two or three inches will suffice; place one piece on the top, and the other secured to the under part of the yard; towards their extremities dub down the superfluous wood, and round the edges ready to receive the requisite woodings.

Preparatory to boring holes for the bolts, set close too the anchor-stock-pieces with wedge upon wedge. Introduce then eight bolts of three-quarter-inch diameter, which must be severally clinched; cut scores for eight woodings, and woold-away with *well-stretched* rope of two and a half inch. The yard may then be replaced aloft. There will be found no necessity for studding-sail-booms, or other spare spars."

TO MAKE A TEMPORARY LOWER-YARD.*

"When a lower-yard is entirely carried away at sea, it is not uncommon to make a yard with the spare spars. This is frequently done by bringing two studding-sail-booms end to end, which together make up the length of the yard; then to scarph them by bringing the spare top-sail and top-gallant-yards in the middle, and other smallspars, (as top-gallant studding-sail-booms, &c.,) to make up the form of the yard. When the different spars are so placed as to overrun each other in the

* See Capt. Glascock's Manual, Vol. I., page 199.

best possible way, they are then to be well woolded together, and the yard is formed."

EXPECTATION OF LOSING A LOWER-MAST.

Every vessel should have a spare lower-cap on board ; it should be in two parts, (for the convenience of stowing,) with bolts for securing it together.

In the event of losing a lower-mast, the cap put on the spare top-mast, and then raised on the stump of the lower-mast, (having been previously fitted for it,) at once enables a jury-mast to be stepped and secured.—Clap on a good heel lashing.

Those vessels which have lower dead-eyes secured to the side, are enabled to get clear of the wreck of a lower-mast more readily than those with the old channels and chain-plates. Those which are fitted in the last mentioned manner, when likely to lose a lower-mast, should reeve a hawser through the lanyards of the rigging on each side, and have it well secured ; they will then be able to disengage the lanyards from the channels, and get clear of the wreck, whose thumping might otherwise injure either the ship's bottom or the rudder.

ON LYING-TO IN A GALE, AFTER THE LOSS OF
MASTS.*

Put a stout span† on a spare top-mast or other large spar, and veer a long scope on a hawser or stream

* For another plan, see Nautical Magazine for 1836, page 212.

† The span would be best of light chain.

chain-cable from the bow. By a spring on it from aft it may be used for wearing. The wreck of a mast would answer well for lying-to with, and when the weather became fine, the spars and rigging would materially assist in refitting or rigging jury masts.

SPARS TO CONVERT IN CASE OF NEED.

Officers will do well to consider what spars they have on board which can be the most readily and efficiently converted so as to supply the place of any which may be lost.

A spare top-mast, or if in a brig, the main-boom are the spars that could be the most quickly converted into a jury-lower-mast or bowsprit; a mizen-mast would be still better if the weather would permit its being shifted.

A top-mast-studding-sail-boom, with the sail as a lug, makes a sufficiently good mizen.

If the bowsprit is sprung let the jib-boom be eased in nearly to the bulwark. When a vessel is lying-to, and there is a heavy sea running, it would be prudent to have tackles up for steadying the fore-mast, as, in the event of the bowsprit being struck and either sprung or carried away, the mast would be saved.

A jib-boom will answer well for making a top-sail-yard.

It is surprising how well vessels answer when jury-rigged, and, in many cases, will sail nearly as fast as when they have their proper masts, yards, and sails.

Sails may be reduced by taking out midship-cloths, and by the head for depth.

Where vessels take the ground, from a falling tide, or from any other cause, they ought to be prepared with three shores on a side, the lower ends a little off.

The first abreast the fore-mast ;

The second amidships ;

And the third abaft the main-sheet sheave.

A measure should be previously taken of the exact depth from the bulwark to the ground ; the lower end of the shores require some weight, and a flat piece for a shoe secured on each, if the ground is soft. On the upper end of each shore there should be a cleat on the fore side and after side, for securing the lashing to the bulwark.

For small vessels two shores on each side would be sufficient ; one might be under the fore, and one under the main channels.

The preparation of shores will be found a very useful one ; many vessels fall over on the water leaving them, and then run considerable risk of filling or not righting again.

ON THE COMPASSES.

As mistakes in a ship's reckoning sometimes occur from an error in the compass cards, or from some fault in or about the binnacle, a careful examination should be made to see that the binnacle is properly constructed and placed, that it has no iron work either in or about it, nor anything of the sort ever put into the inside.

The compasses ought to be compared whenever the vessel is in port.

The spare cards, (of which there should always be two,) must be kept in the box according to the directions, that is, with the north point of one card, and the south point of the other, on the same side of the box. Some years since a man of war was nearly lost from some muskets having been placed on battens overhead, on the half deck, which being directly under the binnacle, the compasses were supposed to have varied in consequence.

GETTING AGROUND.

If a vessel gets aground, (the weather being moderate,)

First, get over the spare top-mast on one side, and the jib-boom on the other, as shores abreast of the main-mast or a little before it; secure some weight to the heel of each—a few shot or a light pig of ballast will do for that purpose—and if the ground is soft nail on a piece of plank as a shoe.

Furl sails.

Out all boats.

Down top-gallant yards, and send top-gallant masts on deck.

Start water and pump it out.

Lay out a bower anchor; be sure it is so laid that the ship does not ground on it.

Every officer should make himself well acquainted with the readiest mode of hanging and carrying out a bower anchor,* as far as relates to the weight of those belonging to his own vessel, and the description of boats

* See "Plan of taking a bower anchor out on a raft of empty casks," by Capt. John Cookesley, R.N., Nautical Magazine for 1835, page 76.

he has to use. If he cannot heave off, he must then endeavour to lighten the vessel by discharging part of the cargo.

Before heaving off, an examination ought to be made, so as to ascertain, as far as possible, the extent of the injury which the vessel has received, since, if the shore be rocky, and the vessel has run on it with much way, it is possible that she might not float, even if she were got off. In this case the lives of the passengers and crew become the first consideration.

STEAMERS GETTING AGROUND.

As steamers would probably do so with very fresh way on, they ought at once to "stop" their engines, but on NO ACCOUNT to attempt to reverse them, until the extent of the injury be ascertained; otherwise they may go down in deep water, as was the case with the *Solway Pegasus*, and *Queen*. Their first duty is to out boats, and place the passengers in safety in them; the crew might then ascertain the state of the vessel; if she is likely to float, and can be got off, the attempt to do so should be made; but if not, the crew can take to the boats.

ON RAFTS.

Good boats* are of course the best and first resource in cases of loss to vessels; those of a good beam, (say

* For a plan of preventing any boat from sinking, when having to encounter an overwhelming sea, or when obliged to leave a ship in a sinking state in the open ocean, see *Nautical Magazine* for 1835, page 76.

•

one-third of the length,) a full bow, and flat tuck are the safest. Diagonal planked boats, such as those built under the direction of the late Mr. Johns, master boat-builder in H. M. dockyard at Devonport, are of the strongest and safest description which I have ever seen. A few wash-boards for shipping might be readily stowed under the thaws, which, when shipped, would render the boat more safe in a sea-way. A few flat breakers, made to fit the bottom of such a boat, would be handy for watering the ship with, and still more in the event of such an emergency as that of taking to boats. [See page 67.]

In the event of the loss of boats, or there not being sufficient for the persons requiring them, rafts must be the next resource. It would be well if officers would give a little consideration to this subject, and turn over in their minds what might be readily constructed for that purpose from the materials in the vessel in which they are serving.

I strongly recommend to the consideration of officers in command of vessels the life raft, proposed by Capt. John Cookesley, R. N., which might be readily made available for a few or many persons. It will be found in the Nautical Magazine for 1835, page 73.

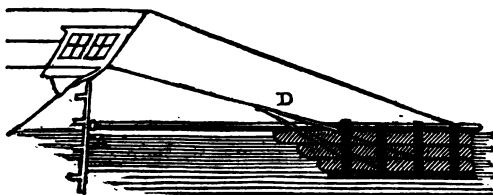
THE NAUTICAL MAGAZINE.

I beg to recommend that valuable work to all mariners, as offering means of multiplying their resources, by the useful information which it contains on most professional subjects; specifying all the improvements that are taking place in navigation, and the discoveries

of whatever is most useful in marine surveying as well as giving early notice of new editions of charts and books of directions. The volumes, which have been already published, form the most useful library that can be in a vessel ; and ship owners ought to be desirous of having them on board, and officers to possess what will furnish them with a most *valuable*, and at the same time interesting and amusing book of reference. Its pages would afford an hour's useful study for every day.

ON THE MANNER OF ACTING WHEN ACCIDENTS
HAPPEN TO THE HELM ; AND A DESCRIPTION
OF A TEMPORARY RUDDER.*

“Should the tiller break in the rudder head, the rudder must immediately be chocked, that its stump may be taken out and the spare tiller fitted, which, together with the chock, should *always* be placed in readiness for immediate use. While the rudder is useless, the ship must be hove-to till it is repaired, or some contrivance prepared to supply its place. The most ready application for supplying the place of a rudder is the following, till a better contrivance can be got ready.



* See Gower's Seamanship, page 159.

To a long stout boom lash several pieces of junk and spars about three fathoms long, one beneath the other, and stiffen them across by several pieces of plank; to the bottom of this fasten some pigs of lead to sink it, and let it be fixed to the stern, as represented by the figure,—the end of the boom A being fastened to the stern post,* and the outer end being supported by a strong topping-lift from the taffarel.† On each side of this temporary rudder, are to be fixed guys from the span D, to haul it over to either side; the lower legs of the span being shorter than the upper, that it may haul over with an obliquity which gives it a tendency to dive, otherwise it might rise out of the water. The guys are to be led through stout blocks, lashed to booms rigged out upon each quarter, and to each is to be fixed a tackle, the falls of which are to be led beneath the barrel of the wheel, and several times about it, and their ends are then to be spliced taut together. The leading of the falls beneath the wheel gives a great advantage, as the steerage is performed by moving the wheel round the same way, as if the proper rudder was complete.” The foregoing contrivance will answer tolerably well, till a more complete temporary rudder is prepared.

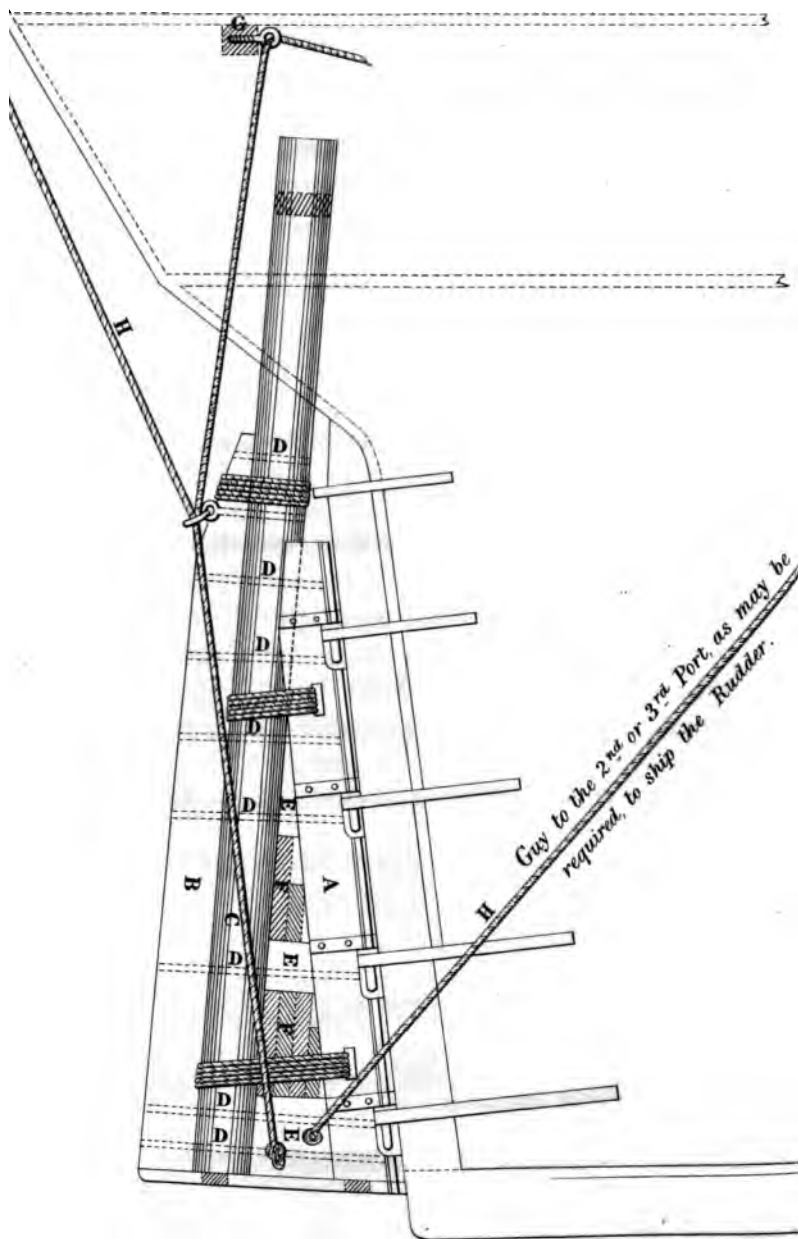
TEMPORARY RUDDER.

The most complete temporary rudder appears to me to be the one directed to be used in H. M. Service, by Admiralty order, of the 28th January, 1839, of which I annex a copy. The piece A being fitted while in

* A grommet of light chain might be used.

† If stern-way top the boom up.





dock, and also the piece B, with the requisite bolts D supplied, a spare rudder is thus always nearly ready for shipping in case of an accident; and a most important provision it is, and one that is as fully, or even more necessary than having a spare top-mast.

COPY OF A

SKETCH OF A TEMPORARY RUDDER,

FOR THE ROYAL NAVY,

Per Admiralty Order of the 28th January, 1839.

REFERENCES.

- A A piece of *oak*, fitted with iron pintles while in dock, and supplied to each ship.
- B A piece for the back, either provided or taken from the ship's stores.
- C Spare top-mast, cut off clear of the shiver hole.*
- D Iron bolts.
- E Chocks.
- F Iron pig ballast.
- G Screw eye bolt, in quarter deck beam, to be put in when required.
- H Rope guys, (through the heel chock E,) to facilitate the hanging of the rudder.

* A jib-boom might do, or part of the main-boom of a brig.

DIRECTIONS FOR FITTING PACKENHAM'S TEMPORARY RUDDER.

In the event of a Ship or Vessel losing her Rudder,* the following directions should be attended to in constructing a substitute for it, namely,

The spare top-mast inverted should form the main piece; the remainder of the up and down pieces to be formed by the jib-boom, or such other spare spars as may be on board. The fore and aft pieces to be converted from such planks as may be at hand; but should there be no store of that kind on board, such parts of the ship should be removed as can be most conveniently spared, and got at with the least difficulty, namely, the flat or plank of the lower deck, hatches, &c. These materials should be well bolted together. The lower-cap,† with the square part cut through, should be of sufficient size to fit the stern post above the lower brace, the distance of which, above the lower part of the keel in large ships, is about eight feet, and in small vessels about six feet. The post athwartships at these places in large ships is about one foot one inch, and in small vessels one foot.

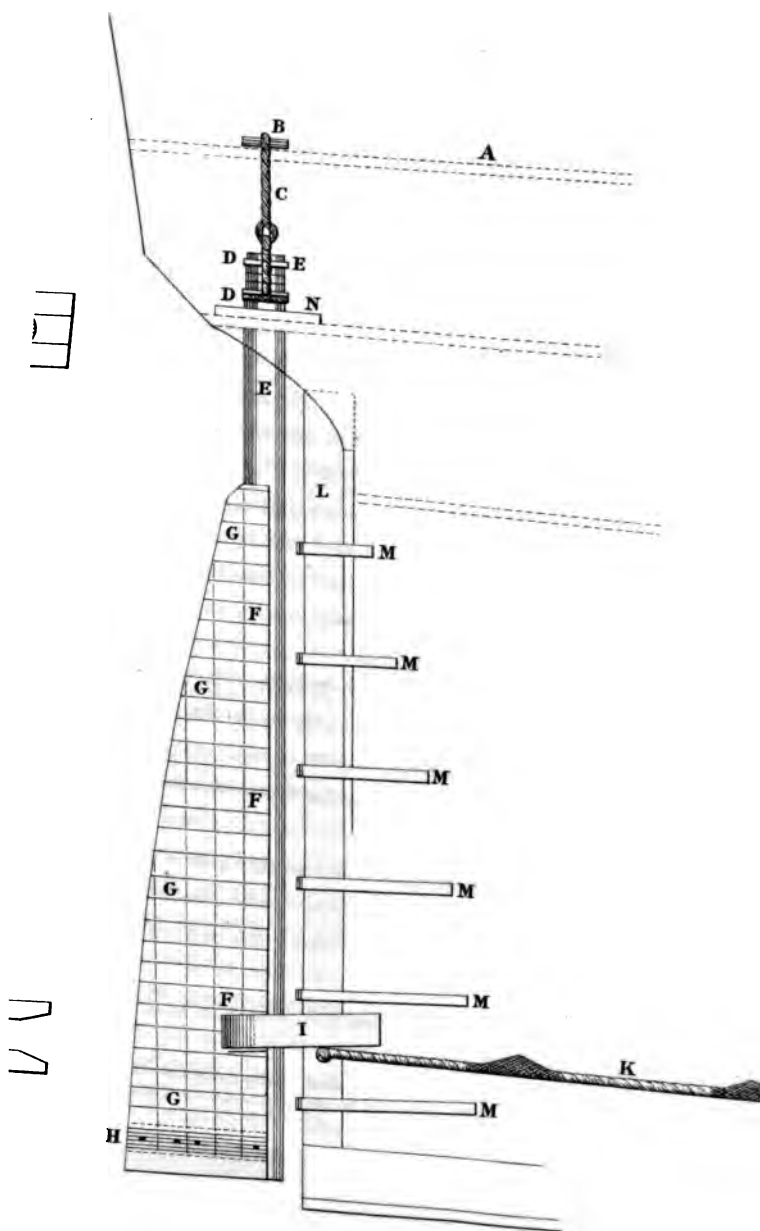
REFERENCES.

- A Quarter deck.
- B Toggle to suspending chain, &c.
- C Suspending chain, selvagee or rope on the head of the rudder.
- D Hoops to secure the head of the rudder, taken from anchor stocks, &c.
- E Inverted top-mast.—The fid-hole to be applied for the introduction of the tillar.
- F Spars, composing the body of the rudder.
- G Fore and aft pieces, taken from the plank of the lower deck, hatches, &c.
- H Pigs of iron ballast, to assist in sinking the rudder, which will be kept in place by a solid piece of wood at bottom, and secured at the sides by the plank.
- I Cap to secure the rudder to the stern post.
- K Hawser attached to the eye-bolt in the cap, which is to be brought under the ship's bilge into the hawse-hole on each side and hove taut.
N.B. The hawsers should be *moused* about every two fathom, to prevent them from being injured by the copper, as well as decreasing the friction when in the act of heaving them taut. (A chain stream cable might answer better.)
- L Stern post.
- M Braces.
- N Pieces of plank fastened on the deck as partners, or steadying pieces for the rudder.

* Supposing the pintles to be broken in the gudgeons, the temporary rudder of January, 1839, could not be shipped, and then Packenham's may be used.

† Or a metal collar, fitted purposely.

DESIGN FOR A TEMPORARY RUDDER.





“The present jury rudder of Capt. Edward Packenham is admirable. But this accident generally occurs in consequence of getting on shore, at which time it not unfrequently happens you lose your masts. If this should be the case, a top-mast can very ill be spared. It would then be well to make the rudder out of the two spare fish, indeed my own opinion is, they are the better material, and can at all times be better spared; on the principle that, if necessary, a top-mast can readily be converted into a fish, but the fish cannot become a substitute for the top-mast. Let the fish be cut off the requisite length, the heels brought together, and the upper ends, (where the tiller is to ship,) exactly the width apart necessary to admit the tiller, to become in truth the tiller-hole. A yard-arm piece, or any broken spar for the filling piece, may be used in the vacancy thus left between the two fish, and another filling piece in like manner *above* the tiller-hole. Then bolt the two fish and filling pieces together, and secure the head by the anchor stock hoops. The rest to be made the same as if the top-mast had formed the main piece, only perhaps it will be better to bolt these back pieces on, so that the bolts may take hold of both the filling piece and fish, to be driven a little slanting or diagonally.

The security against the pressure of the tiller† is greater than in the top-mast, where the substance of the fid-hole is to be so *much* cut away. We made an admirable rudder for the *Abraham Newland*, a West Indiaman of near seven hundred tons, on this plan.

Where the cap is to form the lower security, the fish must of course be rounded.”

* Capt. Griffith's Naval Economy, page 238.

† A spare iron tiller would require a smaller hole.

Sling it on the gangway lengthways and sideways, with the foremost edge uppermost, the aft side underneath; get it out with the yards and stay tackles, and hang it to the thawts between two boats. Tow the boats round to the vessel's stern, with the foot of the rudder foremost. Hook on the head tackle, and bring the rudder lines up on each quarter. Slack the boat's lashings as the head tackle gets the weight of the rudder.

Capt. Glascock, Vol. I., page 202, adds the following directions for getting Pakenham's rudder into its place:—"The whole being prepared, it is then got under the stern, and the head of the rudder hove up through the counter to a necessary height. Bend hawsers taken from the hawse-holes on each side to the hawsers K, and bearing the rudder a midships, heave well taut both hawsers, and the cap will become firmly secured to the stern-post."

OTHER PLANS FOR TEMPORARY RUDDERS.

In the Nautical Magazine for 1836, page 264, are eight or nine plans for temporary rudders, some of which are very good; and at page 266, full descriptions of them are given.

LOSING A RUDDER AT A CRITICAL MOMENT, (such as crossing a Bar,* &c.)

"A ship might lose her rudder at a critical moment in crossing the bar of a river, when a few minutes more

* Nautical Magazine for 1836, page 266.

might run her aground, if she were unmanageable ; and in this case, what temporary rudder is best becomes a question for which a few moments only are given to decide. The plan of steering by the stream cable paid out astern, proposed by a former correspondent, (in page 28, same Vol.,) or by the jolly-boat lowered instantly, with the plug out, and towed astern by a hawser, with guys leading up to each quarter, would perhaps then be adopted ; while a ship losing her rudder at sea would have leisure to adopt any other plan."

It might be an advantage, if every vessel would take some opportunity of trying how she could steer with a jolly boat in the manner described, and what length of tow-line was required to enable her to steer the most easily, so as to avoid wild yawing. The experiment might be made in moderate weather with the wind on the quarter, and also right aft, under top-sails, top-gallant-sails and fore-sail, running five or six knots. {Nothing gives confidence so much as practice.

HEAVING DOWN* AND TAKING IN MASTS AND BOWSPRIT.

As heaving down and taking in masts and bowsprit are duties performed in harbour, but may be required when abroad, and without any resources but those arising from the talents and exertions of the officers and crew, it is advisable to be prepared for such emergencies. General directions for performing those duties are to be found in several works on seamanship ; and

* Nautical Magazine, 1834, page 334, H. M. S. *Success*.

86 TO LET GO ANCHORS ON A LEE SHORE.

officers will find it advantageous to have one such work on board to refer to. Lieut. Fordyce's Outline of Naval Routine, page 166-170, gives directions on both subjects.

TO LET GO ALL THE ANCHORS UPON A LEE SHORE.

As soon as vessels are well on soundings, they ought to bend cables* and see the tiers are clear; a short range of each should be then taken and the cables bitted; in a gale, and expecting to be wrecked, this cannot be done properly. If a vessel unfortunately find herself in a severe gale on a lee shore, and her soundings should indicate the probability of being wrecked, let her try, as a last resource, the directions under the above heading, "to let go all the anchors upon a lee shore," the anchors being prepared for cutting away as above directed, and axes ready; the orders to do so are only required, and if the tiers are clear, the cables must run, and the ship may be saved.

The hatches should be previously well battened. Do not run into less than six or seven fathoms before the anchors are cut away. Leadsman that can be depended on must be in the chains; a moment of irresolution and all may be lost.

* Chain cables should be carefully inspected every six months; the bolts driven, scraped, and greased, and all the pins wiped, white leaded, and carefully replaced. When the cables are got up, see that they are securely clinched; attention to these points, and a knowledge that the cables are in a good state, will relieve the mind from much anxiety when everything depends on the cables and anchors. I would rather have the latter too heavy than too light.

* "When it becomes impossible to 'crawl off' a lee shore, and carrying canvass is of no avail, Hutchinson recommends the adoption of the following practice as best calculated to rescue the ship from her perilous position. After preparing all the cables and anchors, so as to enable the latter to be let go alternately, and dropt at a little distance from each other, and as much as possible in a line parallel to the shore, proceed thus." 'Furl the square-sails as quickly as possible, and brace the yards full; set the fore-top-mast, fore and main stay-sails, and put the *helm up*, so as to keep way on the ship as the cable of each anchor runs out in succession. The anchors pertaining to the cables in the *weathermost* hawse holes should be dropt first.' As soon as the anchors are all let go, the masts should be cut away directly, in order to give the anchors the best chance of holding, and by so doing save the ship and crew. Remember to cut away the stays first. If any mast is to be spared (and that must be for the consideration of the captain) it should be the fore-mast; when once the ship drives, it is a great chance if she can be brought up again.

MAKING SAIL FROM A DANGEROUS ANCHORAGE ON
A LEE SHORE IN A GALE.

In Capt. Glascock's Manual, Vol. I., page 287—292, may be seen the novel and seamanlike method employed in extricating H. M. ship, *Magnificent*, Captain Hayes, from an extremely perilous position, situated in the

* See Capt. Glascock's Manual, Vol. II., page 163.

88 TO KEEP SUPPLY OF WATER ABOVE HATCHES.

midst of rocks, with yards and top-masts struck, and on a *lee* shore, and that being an enemy's, on the 17th December, 1812, in a gale of wind."

TO KEEP A SUPPLY OF WATER ABOVE HATCHES.

In Nautical Magazine for 1834, page 412, "On avoiding accidents at sea,"—"it is stated that, according to Act of Parliament, a certain portion of fresh water, in casks, is directed to be secured above hatches; a wise provision, which however is not invariably observed."

ON INEFFICIENT MANNING AS AN OCCASION OF SHIPWRECK.

I leave this subject for the consideration of more competent judges, and to those who have the power of applying a remedy if it be required.

In page 907 of the Nautical Magazine for 1840, a plain practical letter on "inefficient manning," will be found considering the practice as conducive to shipwreck; the letter is well worthy of the best attention.

The writer of the letter alluded to adds a scale for the consideration of his superiors in knowledge and station, which he thinks would be the means of saving many a brave fellow from a watery grave.

"Proportion of Men and Boys to Tonnage."

Tons.	Men.	Per Cent.
From 40 to 50	5	10
— 50 to 70	6	8
— 75 to 100	7	7
— 100 to 125	8	...
— 125 to 150	9	6
— 150 to 175	10	...
— 175 to 200	11	5 and 1-12th
— 200 to 225	12	...
— 225 to 250	13	...
— 250 to 275	14	...
— 275 to 300	15	5

"Ships above 300 Tons to carry five men for every 100 Tons."

H. M. S. "PIQUE'S" ESCAPE FROM WRECK.

In Nautical Magazine, 1841, page 97, appears a very interesting letter from an officer of H. M. S. *Pique*, (commanded by Capt. Boxer, C. B.) giving a short account of that ship's narrow escape from being wrecked near Acre, on the 2nd December, 1840. H. M. brig *Zebra* was wrecked at that time, and H. M. steamer, *Vesuvius* parted her cables, but was just able to steam off.

The *Pique's* proceedings then afford very *useful information* in case of such a threatened calamity. She cut away her masts; the fore-mast, on falling,* lay over her riding and only cable, which it was then feared

* Great care must be taken to cut the stays first, (to let the masts fall aft,) and then the rigging, and by cutting the mast on the opposite fore side to the direction in which it is intended that it should fall, to give it an inclination to fall over the side and not fore and aft. Place the crew as much as possible in security before the masts fall.

would part. The mizen-mast, when it fell, injured her rudder-head.

My view in calling attention to such cases as the *Pique's* escape from shipwreck, and the *Magnificent's* being extricated from her perilous position, [alluded to in page 87,] is to take advantage of these and other examples, so as to profit by the proceedings of the able officers who were in command of those ships in moments of great emergency.

ON SHIPWRECK ON THE COAST OF BRAZIL.

The principal object of this small work being to diminish sea-risks, of which the worst is shipwreck, I wish to give a caution in respect of one particular coast on which I have very often navigated, namely, that of the Brazils. Hardly a year passes without recording the loss of some valuable vessel on that coast, generally about the Rio San Francisco, between Bahia and Pernambuco.

There is no coast so easy to navigate upon as that of the Brazils, with common attention and care, as the weather is there generally fine.

The vessels which have usually had this misfortune have been those bound home from Australia, after leaving Bahia; such might receive a caution from Lloyd's agent there before they sail; and they should also recollect that after leaving Bahia they are not to expect to follow up the coast to the northward, and to cross the equator without tacking.

There is an indraught of a point and a half to be allowed on the course when on a wind.

Do not stand in to less than twenty fathoms* by night, and if you wish to keep on the coast do so by day, and stand off by night.

ON THE DUTY OF STAYING BY A DAMAGED VESSEL.

When two vessels have run foul of each other, the one which is the least injured is bound, by every sense of justice and humanity, to stay by the other to render every assistance in her power; a contrary proceeding ought to make the guilty party liable to some punishment. If one appears likely to sink, the boat lashings should be cut, that the boat or boats may be got out or float off.

ON THE BAROMETER AND HURRICANES.

In the supplement of the Nautical Magazine, 1834, pages 769—775, are detailed the particulars and description of a hurricane in the East Indies in 1808. The ship was in the latitude of 10° south, and 80° east. The last paragraphs are—"Such were the disastrous effects of this memorable hurricane; from a summary of which I think myself entitled to draw the following practical inferences; namely, that had we instantly attended to the timely warning of the *Barometer*, by bringing the ship to the wind, and making preparations for the storm, instead of scudding before it until we

* Whenever a vessel is in deep-sea-soundings, she ought to get a cast of the lead every two or four hours. If in hand-soundings, a man should be kept in the chains constantly, or nearly so.

could scud no longer, we should have escaped with as little injury as the two ships I have just alluded to ; and that, had the three unfortunate ships which foundered in the storm pursued a similar course, (which it may be fairly presumed they did not,) a very different fate might have befallen them too. But, lest the fatal catastrophe of this hurricane should not be deemed sufficiently conclusive, I shall mention the result of another, no less fatal in its consequences, which was encountered in the following season by another fleet of Indiamen, nearly in the same latitude and longitude, whilst under convoy of the late Lord Exmouth. On this occasion, four of the finest ships of the fleet, crowded with passengers from Calcutta, were supposed to have foundered, as they were missing immediately after the storm, and were never heard of more. The last time they were seen was by Lord Exmouth himself, when they were observed to be scudding before the gale, while the rest of the fleet were lying-to. Here then, we have another melancholy instance in point, which, coupled with the preceding, ought to satisfy the mind of the most sceptical seaman, as to the infallibility of the *Barometer*, in indicating the approach of hurricanes, within the tropics more particularly ; and consequently of the inestimable value of this instrument to every commander of a ship, and more especially to those whose destination is India.”

As there will be now a considerable increase in the number of vessels bound to and from China, and probably many officers will be so employed who have not been accustomed to navigate those seas, it is to be hoped that all such will furnish themselves with Horsburg’s valuable directions, and with whatever other information they can obtain which may be likely to prove useful.

As far as it may be possible, they would do well to have their voyages out and home so arranged, as to avoid being in the latitudes and longitudes where typhoons are usually encountered, at those seasons of the year when they may be expected.

It appears from all the records which I have seen, as well in* Col. Reid's valuable work on the Law of Storms as in other places, that first, the Barometer falls nearly an *inch* before those destructive hurricanes take place; secondly, by keeping to the wind you may be likely to be sooner out of their influence; and thirdly, in hardly any case do vessels, however well prepared, escape without losing their lower-masts. In the second note of page 20, I have recommended scudding before a hurricane only *as a choice of evils*, since I fear most vessels would upset lying-to, for it is evident that a vessel before the wind is less oppressed by its force, than when lying-to. Could she however stand up against it, lying-to is much preferable, (particularly in a hurricane in the East Indies,) as you would then be likely to be exposed to its action during a much shorter time.

At the season when such weather may be expected,
Let long top-gallant-mast ropes be kept rove.

Have blocks to the top-mast heads for sending down
top-sail yards.

Have top-blocks hooked, and tackles ready for striking
top-masts.

* The Law of Storms by Col. Reid contains the most valuable information that has been ever published, for enabling navigators to profit by the history of the disasters which have befallen vessels at different times in all parts of the world, and from the details there given all officers might derive useful information.

Have two strops on each lower yard ready, and tackles hooked for striking them.

When a hurricane is indicated, and as soon as the Barometer has fallen to 29.50 there will be usually four or five hours, if not more, to make the vessel as snug as possible. I would not wait even so long if convinced of an approaching hurricane.

In order to be prepared in the best possible manner for lying-to, and to avoid the misfortune of being hove on your beam-ends, and experiencing the entire loss of masts, which must take place before a vessel can right again, (though it is a great probability whether she will right at all) I would proceed as follows;—

After top-gallant-masts have been got on deck, send down top-sail-yards.

Strike lower-yards and lower them down quite to the gunwale, and lash them there as securely as possible.

Strike top-masts, and let them come on deck and ease in jib-boom. The ship will then have nothing standing but lower masts and bowsprit, and no sails but try-sails and fore-stay-sail.

To give the ship every chance when the hurricane comes on, the main-mast should be the first mast to be cut away, the lee rigging and stays having been previously cleared, and afterwards the weather rigging cut. The mast would not require many strokes of an axe on the weather side to bring it down. By parting with it in time, you may prevent the ship going over, and also save the fore-mast and bowsprit.

When the ship is relieved from top-hamper, it must depend on circumstances whether she requires to be relieved from weight or lumber on deck.

Boats and anchors to be previously very securely lashed.

If the increase of the wind and sea prevent the completion of all the proposed duties, accomplish as much as you can, and recollect that every pound taken from aloft adds materially to the safety of the vessel; but with the premonitory warning from the Barometer, and the usual indications, I think that, with an active crew and a hearty good will, most of them may be got through.

ON SHORTENING AND MAKING SAIL FROM THE
INDICATIONS OF THE BAROMETER.

From what has been said it must be recollected that as the changes of weather are indicated by the falling of the quicksilver before bad weather, and its rising again before fine weather, officers who have the advantage of a marine Barometer, when they have shortened sail from the sudden or steady falling of the quicksilver, should not be in too great a hurry in making sail again, until they consider they have had the gale which has been indicated. It is generally observed that in the North Atlantic, when the quicksilver has fallen low for a S.W. wind, it begins to rise before a N.W. gale comes on, and it does the same in South America before a Pam-

pero. In both cases, of course, sail should not be made until the gale be over, although the quicksilver begin to rise before it comes.

The height of the quicksilver, it will be seen, is not to be regarded as a guide, but its relative rising and falling.

Suppose it to be 29.90, and it fell to 29.50, I should prepare for a gale, and when it rose again steadily, I should make sail as required; and again, if from 29.40 it fell to 29.0, or lower, I should prepare for very heavy weather; after which I should anticipate favourable weather, and act accordingly on its rising, although the quicksilver then might not be higher than 29.30, it having been much lower.

ON THE ADVANTAGE OF A LONG SCOPE OF CABLE.

Since printing the directions on this head, [page 14,] I have received a letter from Commander Walkie, R.N., who commanded H. M. packet, *Goldfinch*, for several years. He states that "the *Goldfinch* rode out that terrific gale on the 24th November, 1824,* at St. Helen's, with one hundred and sixty fathoms of chain cable, on one anchor, the small bower of thirteen cwt.† She also rode out a heavy hurricane in the harbour of St. Thomas, (West Indies,) in August 1825, with the same quantity of chain and the thirteen cwt. anchor, when the greatest

* In that gale the breakwater at Plymouth was materially injured, and the loss of shipping very great. The little *Goldfinch*, however, rode out the same gale safely in an open roadstead..

† The best bower was sixteen cwt.

part of the vessels either went down or were driven on shore. I attribute my riding out these terrific gales to *timely* giving a long scope of cable, from a neglect of which nine-tenths of the merchant vessels are lost. It is too late to veer after the anchor has started."

THE BALLAST SHIFTING AT SEA.

This frequently occasions losses at sea. To prevent its occurrence, when iron ballast is stowed, let a few oak battens be nailed from the sides athwart-ships, to secure it; or when shingle ballast is used, place a light flooring over it, secured by a few battens athwart-ships; this would most probably prevent such a calamity, which usually occurs when a vessel is struck by a heavy sea, or when hove on her beam-ends, and prevents the possibility of her righting. When the ballast is stowed, it ought to be at the same time secured from shifting; this is of great moment, and a few strong battens will do it.

OFFICERS SEEKING EMPLOYMENT IN STEAMERS OUGHT TO STUDY THE CONSTRUCTION AND MANAGEMENT OF STEAM ENGINES.

Within these few years, many officers in the royal navy have studied at the foundries, in order to become thoroughly acquainted with every part of the machinery in steam vessels. The advantages of the practice are many. The Messrs. Napier, of Greenock, have been

particularly liberal in the facilities which they have afforded to officers for acquiring such information.

There are also lectures given on the subject of the steam engine and its application to navigation, at the Polytechnic Institution, Regent Street, London, which all officers who command or serve in steamers would do well to attend when they can get the opportunity.

WRECKED IN A GALE.

When this sad fate appears inevitable, it would be well to make choice, (if choice can then be made,) of what appears the best part of the coast and the freest from rocks for beaching her. The manner in which the Deal boatmen beach their boats is by laying them, with the assistance of the helm, half broadside on, or rather bow and quarter on, having previously given the vessel a *heel or list in shore*. This may be done either by trimming, or by the sallying of the crew before the time that the vessel takes the ground. Such a position will offer the best means of saving the crew, who may also be materially assisted by cutting away the masts, so as for them to fall towards the shore, which they may then help those on board to reach. In establishing a communication with the shore, if it be by a boat, the end of the deep sea-line should be taken in her; or if it be by some good swimmer,* with a cork jacket on, the end of the log-line will serve the same purpose; by either of these, hawsers or other large ropes may afterwards be got on shore.

* Every person should learn to swim. Swimming schools at sea ports should be encouraged.

The means of getting on shore from a wreck are
By life boats.

- rafts.
- parts of the wreck.
- cork jackets.

See also Nautical Magazine for 1834, page 613.

At page 614,—“A canvass cot, with large holes at the bottom, to admit the water to pass through freely, and having cross bars of thick rope, should also be kept in readiness for such an occasion. Raw hide will be the best covering for the travelling grommets.” Some other expedients are mentioned which are for the consideration of officers in charge of vessels.

Assistance may be furnished from the shore by Capt. Manby's efficient though simple apparatus.

And last, though not least, if on the coast of Great Britain, there is the valuable and heroic assistance always rendered by the gallant coast guard.

ON THE DUTIES OF HARBOUR MASTERS.

Harbour masters, or captains of the port, should be furnished with full authority in all ports to direct every vessel to be properly and safely moored, sheet anchors ready, &c.; and also, by signals or otherwise, to order lower yards and top-masts to be struck when they think it necessary. All captains before sailing ought to be required to call at the office of the harbour master, who, if he should see very bad weather to be indicated, might caution them against putting to sea.

At all ports, harbour masters or captains of the port should be in possession of the method of raising sunken vessels, as practised in raising *H. M. Schooner, Pincher*, by Mr. F. W. R. Sadler, (Assistant Master-attendant,) H. M. dockyard, Portsmouth, who has also published an account of his proceedings.

MARITIME LAW.

The select committee of the House of Commons in their report of August, 1843, consider that "some better code of Maritime Law than that which now exists for the regulation of the duties of master and seaman on board of merchant vessels is much wanted, with a view of increasing the security of shipping, promoting the comfort and health of seamen, and of preventing desertion."

Such being the report, the wisdom of Parliament will no doubt apply a remedy.

The following points on that subject are submitted for consideration.

Public register offices for seamen to be at all ports, to contain the heads of their certificates, &c. At these offices men out of employ could make their agreements for shipping, &c.

What is termed "crimping" to be punishable.

Officers in charge of vessels require to be well supported in their authority; and they should be furnished, by law, with as much power as is necessary to preserve good order, and restrain unruly ill-conducted seamen.

Entries might be made, in the log, of drunkenness,

or other misconduct ; and the names of an officer and one or two other persons added, as witnesses to establish the fact.

Greater facilities should be afforded to persons in command of vessels to have fines or imprisonment inflicted for crimes on board, more particularly drunkenness and insubordination, and for desertion before the voyage is completed.

In foreign countries, consuls and captains of men of war might be furnished with additional powers to act as magistrates, either in aiding officers of merchant vessels in preserving discipline, or protecting the men in cases of ill usage.

There is nothing which seamen so much dread as imprisonment abroad, and the exercise of the power by the consul would have beneficial effects ; the expense might be charged on the offender's wages.

The men's provisions should be sufficient and good.

The space between decks for the seamen's living and sleeping should be as large, airy, and clean, as could be fairly allowed.

It is very much the custom at sea to employ "all hands" by day ; it is a question whether the men should not be entitled to some watches below ; if any necessary duty is required, of course they must perform it.

The following subjects are also submitted as points for consideration whether they might not well be matter for legislative interference.

All vessels to carry a light at night,* [page 52.]

* I think a hint might be taken from the railways, in having signal lanterns made with different coloured glass, in front (say green) and back (say red,) to determine whether the vessel showing them be coming to or going from you.

To establish a night signal for vessels in distress,*
[page 53.]

A partition bulkhead forward in steamers, [page 34.]

Fire pumps or engines, [page 34.]

Life buoys, [page 34.]

Cork jackets or belts, [page 34.]

What instruments are proper, [page 44.]

Scholar apprentices,† [page 43.]

Mates, [page 43.]

To establish signals‡ from Barometrical indications at
fishing stations, [page 25-26.]

* With the improvements in chemistry and fireworks, this ought not to
be difficult of attainment.

† Prizes for skill in practical navigation, would increase emulation.

‡ The first signal to be made *as soon as* the quicksilver has FALLEN to
29.40; and the second signal *as soon as* it has FALLEN to 29.0. The signal
to be hauled down when the gale commences.







